JANUARY, 1952

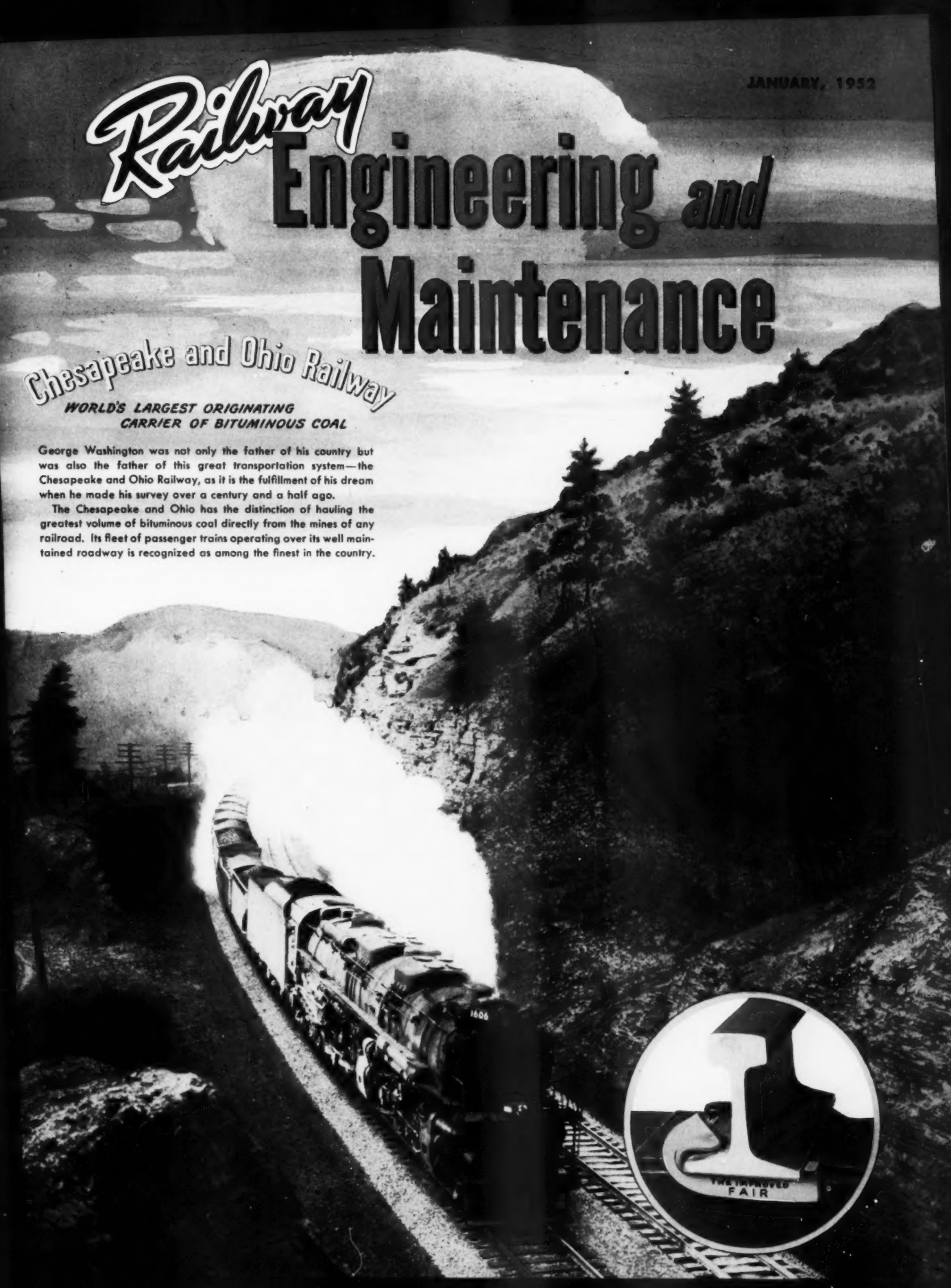
# Railway Engineering and Maintenance

## Chesapeake and Ohio Railway

***WORLD'S LARGEST ORIGINATING CARRIER OF BITUMINOUS COAL***

George Washington was not only the father of his country but was also the father of this great transportation system—the Chesapeake and Ohio Railway, as it is the fulfillment of his dream when he made his survey over a century and a half ago.

The Chesapeake and Ohio has the distinction of hauling the greatest volume of bituminous coal directly from the mines of any railroad. Its fleet of passenger trains operating over its well maintained roadway is recognized as among the finest in the country.




THE P. & M. CO.

ICAGO • NEW YORK • DENVER • WASHINGTON • ST. LOUIS • CLEVELAND • ST. PAUL • BOSTON • SAN FRANCISCO

# these "maintenance men" are on the job rain or shine

In winter's zero weather or summer's sweltering heat — in traffic or out— Reliance Hy-Pressure Hy-Crome Spring Washers automatically compensate for looseness resulting from wear, bolt stretch or temperature changes.

Quality control of manufacture and never-ending research and testing by Reliance's Research Laboratory help *you* reduce track maintenance costs when Reliance Hy-Pressure Hy-Crome Spring Washers are used on track joint bolts.

*The Edgemark Of Quality*

The powerful reactive tension developed by the uniformly heat-treated cold-drawn alloy steel used in the manufacture of Reliance Hy-Pressure Hy-Crome Spring Washers keeps rail joint bolts *tighter longer*, reduces maintenance and costly rail joint treatment.

Try Reliance Hy-Pressure Hy-Crome Spring Washers where your maintenance costs are highest and check the results yourself.

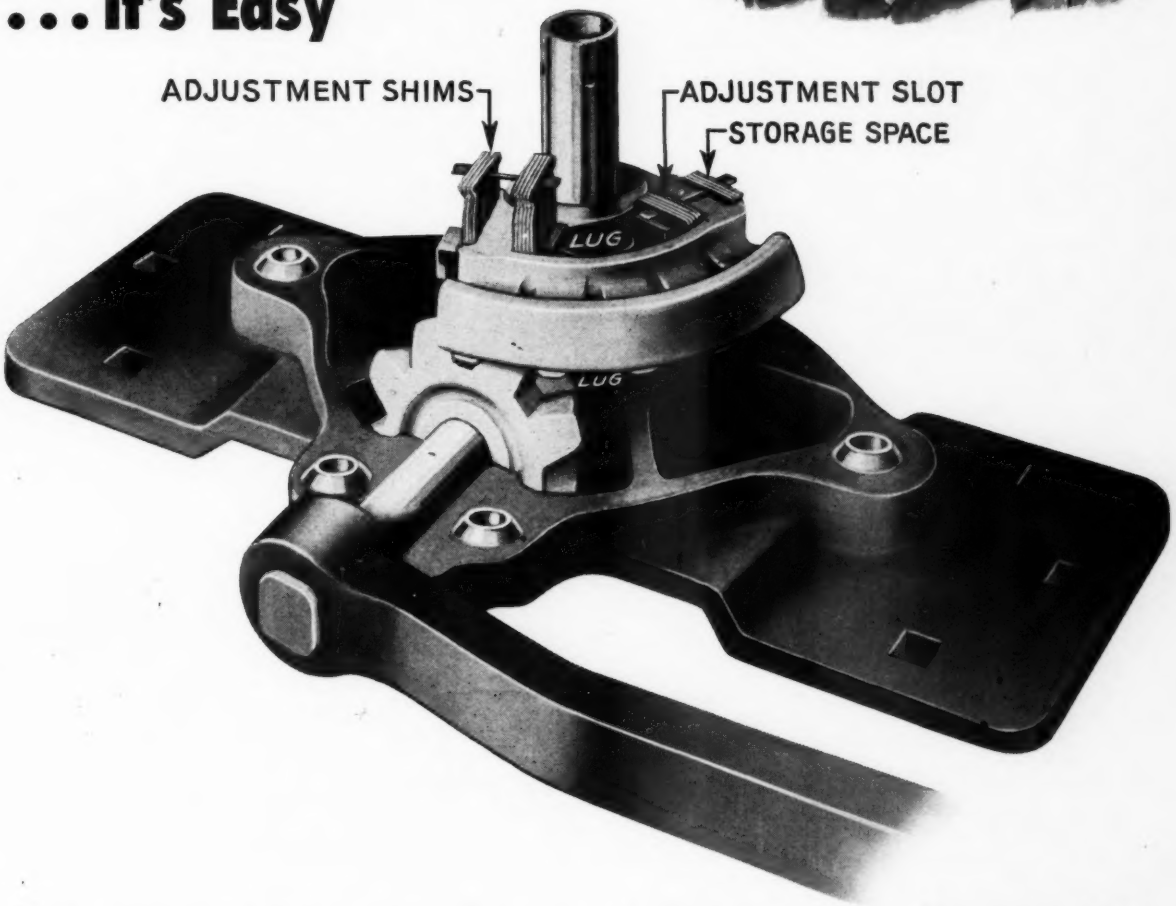
## RELIANCE hy-pressure hy-crome SPRING WASHERS

EATON **RELIANCE DIVISION, MASSILLON, OHIO**

*Sales Offices:* New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

*Why make hard work of switch-point adjustment?*

# With Bethlehem's *NEW CENTURY* ...it's Easy




Here's a stand that's built for something more than throwing a switch. It's Bethlehem's New Century, Model 51—the model with a built-in device that greatly speeds up and simplifies switch-point adjustment.

Works like this: the operator merely releases and pushes aside an outer cover, loosens two nuts, and adds or removes shims to increase or decrease the throw of the switch points.

Easy? Of course. Easy as it sounds. The adjustable New Century* takes all the nuisance out of a job that's so often laborious and time-consuming.

And, in addition, this switch stand has other great features that make it a top choice for service with heavy rail. Because of its sturdiness and smooth, easy action, we recommend its use in main lines, branch lines, yards—whatever the volume of traffic.

**Bethlehem's New Century switch stand is also available in a nonadjustable type, known as the Model 50. Both the 50 and the 51 can be furnished in a low design and an intermediate design.*

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL



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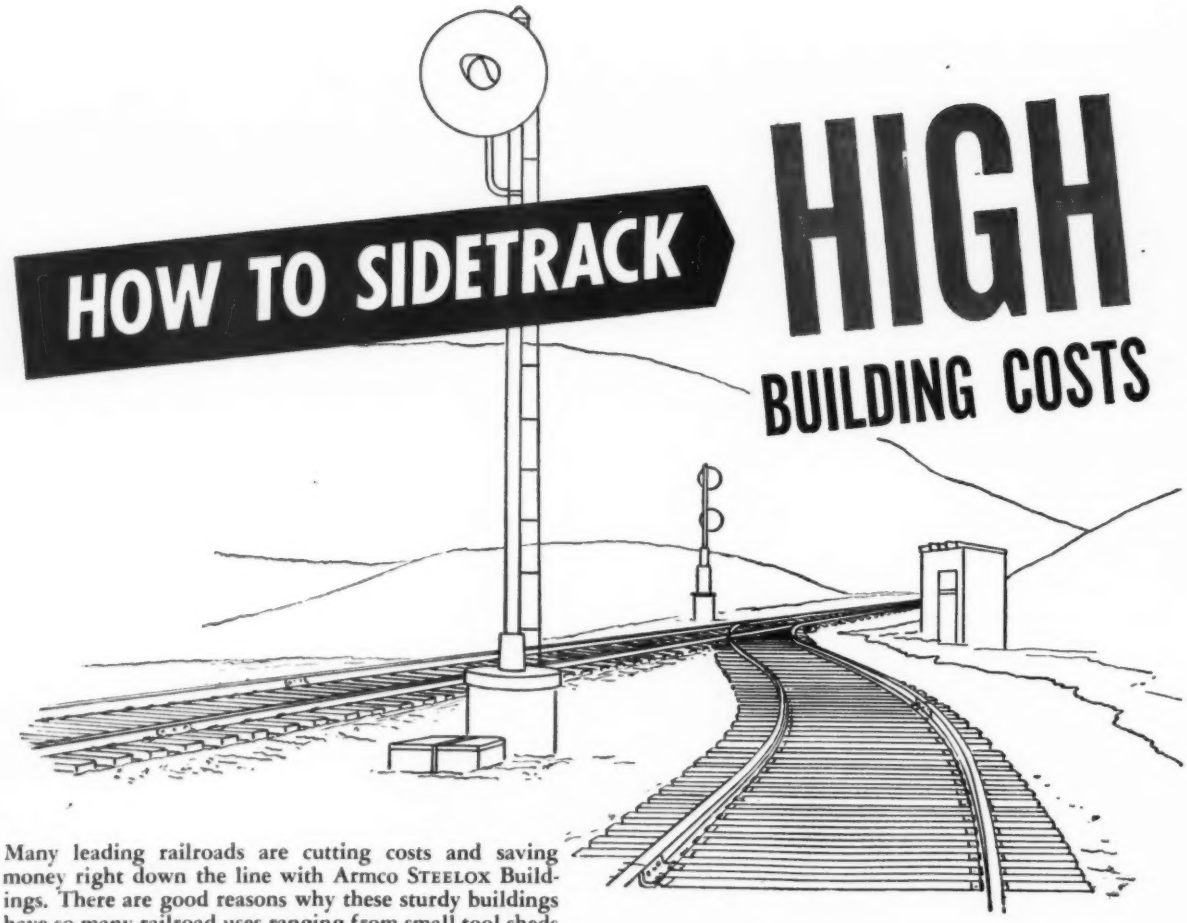
# HOW TO SIDETRACK HIGH BUILDING COSTS



Many leading railroads are cutting costs and saving money right down the line with Armco STEELOX Buildings. There are good reasons why these sturdy buildings have so many railroad uses ranging from small tool sheds to repair shops or passenger and freight stations.

STEELOX structures are shipped ready for quick, easy erection. Your regular section crews do the job without difficulty by following instructions that come with each structure.

Maintenance costs are low because STEELOX construction assures long life with minimum upkeep. There is nothing to warp, crack or rot. An occasional painting is about all that is ever needed. And the special Armco ZINCGRIP-PAINTGRIP Steel requires no pre-treatment and makes paint last longer.

Also important, Armco STEELOX Buildings are all steel for utmost fire-resistance. They can easily be made lightning-safe by grounding opposite corners. Doors and windows can be placed where you want them and if desirable can later be easily rearranged.

Should conditions change your building can be quickly extended with standard parts, or moved to a new site without loss of material.

Write us for complete information on STEELOX Buildings applied to your specific needs. Armco Drainage & Metal Products, Inc., 1132 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

**Armco STEELOX Buildings** ARMCO

MORE SCRAP MEANS MORE STEEL . . . TURN YOURS IN TODAY!

# Does things a Track Type Machine can't do!

YOUR crawler rigs will pay for themselves by their very versatility. Load them and work from a standard flat car (they can be loaded or unloaded under their own power) or work along the line from the ground and take care of those off-the-line jobs a track type rig can't get to.

Versatility keeps a machine busy all the time. As soon as it is through with today's job it's ready for tomorrow's and a trailer will put it there even if it's well off the line.

Northwests have been proved on the leading railroads of the country on all classes of work. Their simplicity of design, their unusual advantages for ease of upkeep and operation make them low in operating cost and fast on the job.

If you have bank to trim, widening to do, rail to handle, drainage work to do, bridges to build, aggregate to handle, short line or siding construction, storeyard work, shoulders to build out—if you have any lifting or digging to do a Northwest will save you money and get the job done faster. Why not lay plans now for a Northwest on your division?

**NORTHWEST ENGINEERING COMPANY**
1513 Field Bldg.
135 South La Salle Street
Chicago 3, Illinois

# NORTHWEST

**THE ALL PURPOSE RAILROAD MACHINE**
**SHOVEL • CRANE • DRAGLINE • PULLSHOVEL**

# What's the best way...

# to cut rail cropping costs

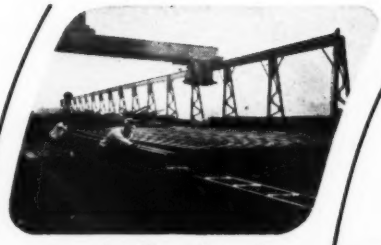
## by portable field units?
## ...or fixed installation?

Both are excellent!... but, many roads find that a centrally located rail cropping plant usually lends itself to a more efficient and economical operation.

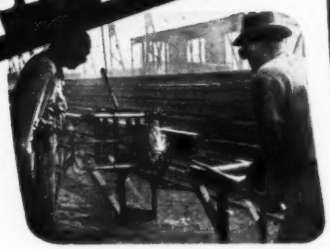
With a fixed installation, the work can be set up on a continuous production basis... rails can be collected at a central point, and the road can realize the full capabilities of specialized workmen.

As shown in the accompanying photographs, rail cropping is simple, easy and quick. The Airco developed rail cropping machine employs two highly efficient, oxyacetylene flame cutting tips, which cut rails of any size, making as many as 25 cuts an hour, and producing a surface that requires a minimum of grinding.

*For further information, write your nearest Airco office.*



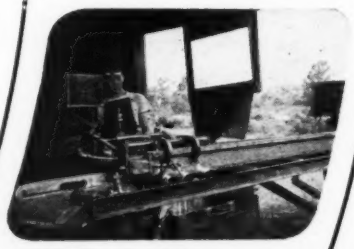
*...conveying the rail to the cropping machine.*



*...making the bottom, or backward, cut. (Note: This machine is portable and can be transported to the right-of-way, if so desired.)*

*...cropped rail, showing cut quality.*

*...finishing the cut end.*



*...drilling bolt holes in rail end.*

**COSTS COME DOWN UNDER THE AIRCO PLAN**

AIRCO **AIR REDUCTION**

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
*Divisions of Air Reduction Company, Incorporated*
*Offices in Principal Cities*

# Here's what WE mean by

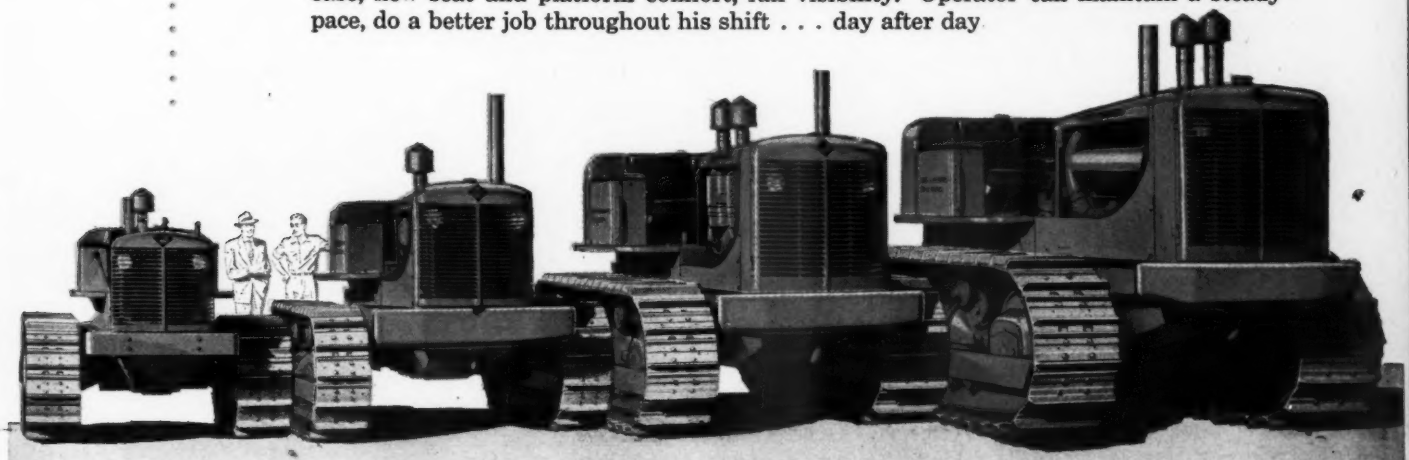
# The Newest, Finest Tractor Line on Earth!

**DESIGNED FOR YOUR JOB** These Allis-Chalmers tractors are *new from the ground up* . . . without compromise anywhere in design or material. They are built to give you outstanding performance on any job, with any equipment—drawn or mounted. Fully matched line of Allied equipment!

**BUILT TO "TAKE IT"** These are the finest tractors ever built . . . with ample capacity and strength in every part! You can depend on them to take the loads and jolts of today's jobs . . . because they are modern tractors built for the most gruelling operating conditions. They will more than measure up to your expectations!

**EASY TO SERVICE** Adjustments are easier . . . lubrication simplified and lube periods greatly extended. Mechanics say these tractors are the easiest to service and repair. This all adds up to less down time, more producing time . . . longer tractor life at less upkeep cost.

**EASY TO OPERATE** Conveniently located controls respond to the slightest effort . . . and are operated in the same familiar way — nothing tricky to "catch on to." There is new shifting ease, new seat and platform comfort, full visibility. Operator can maintain a steady pace, do a better job throughout his shift . . . day after day



| HD-5 | HD-9 | HD-15 | HD-20 |
|---|---|---|---|
| 40.26 drawbar hp. | 72 drawbar hp. | 109 drawbar hp. | Hydraulic Torque Converter Drive |
| 11,250 lb. | 18,800 lb. | 27,850 lb. | 175 net engine hp. 41,000 lb. |

## YEARS AHEAD

Each of these new Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each sets new standards in its class for performance, strength, servicing, operation. Get the full story from your Allis-Chalmers dealer NOW on this — The Newest, Finest Tractor Line On Earth.

# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

# COMPRESSION
## *Rail Anchors*

**Compression-held rail does not run in either direction, which is particularly important for C.T.C. and other remote control layouts.**

**Protect these vital installations with *two-way holding* Compression Rail Anchors.**

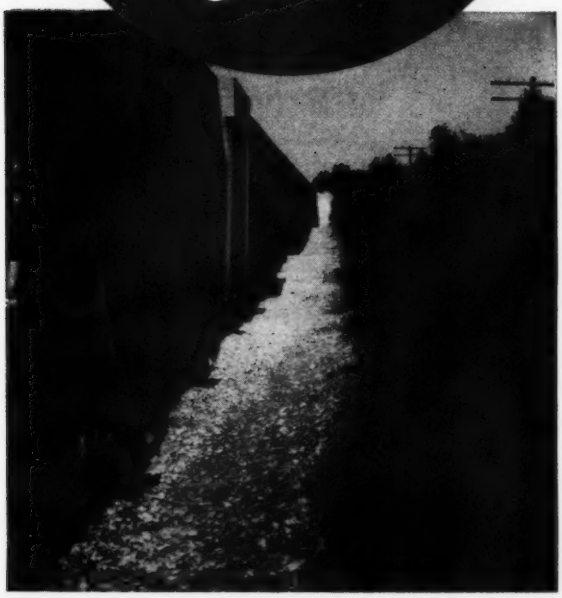
## THE RAILS COMPANY

General Office
178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.

# It costs less

## to keep out unwanted growth with Chapman Chemicals



### WHAT'S YOUR PROBLEM?

■ New chemical developments make it possible for railroads to maintain a clear right-of-way and clean track-ballast and trestle areas with less labor and at far less cost than by methods formerly used.

**For clean track ballast area,** spray with Sodium TCA. It kills foliage and roots of such perennials as Johnson, Bermuda, Quack, and Blue grasses. In areas where only control of grass foliage is desired, use Penta Weed Killer . . . the cheapest and most effective contact herbicide.

**For clear right-of-way,** use Chapman Brush Killer. It effectively controls weeds, vines, brambles, and other woody growth, without killing grasses.

**For bare ground under trestles,** use Borascu or Polybor Chlorate to sterilize the soil and stop all growth. It is non-poisonous and non-combustible. One application may last two years or longer.

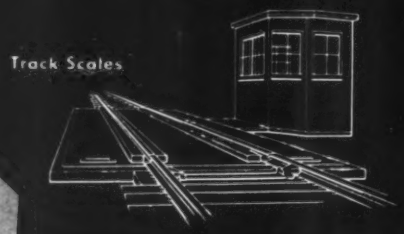
The great variety of plant life, climatic conditions and soil types make it impossible to offer any one chemical prescription for all weed killing problems. We will be glad to give you recommendations applying to your problems.

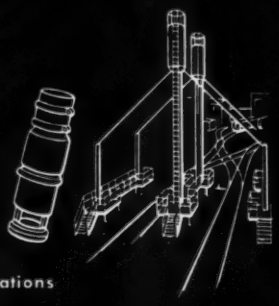
**CHAPMAN CHEMICAL COMPANY**
**Dermon Building, Memphis 3, Tenn.**

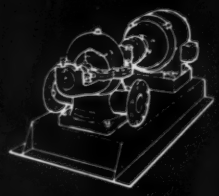
CHAPMAN™

# Weed Killers

**DISTRIBUTORS OF BORASCU AND POLYBOR CHLORATE 88 FOR PACIFIC COAST BORAX CO.**








# Sign of Lower Cost Railroading . . .

**In the Fairbanks-Morse line there are almost unlimited opportunities to cut costs in every phase of railroad operation and maintenance.**

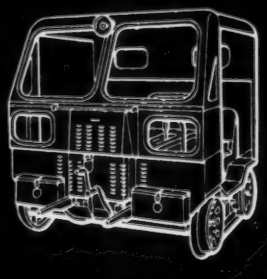
**Rail cars . . . scales . . . sanding stations . . . pumps . . . motors . . . off-track lighting and power equipment . . . a range of sizes and types, each with a background of proved long-time, low-cost performance for railroads everywhere—that's the Fairbanks-Morse line.**

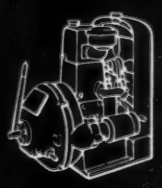
**Every Fairbanks-Morse branch office is staffed with railroad equipment experts. Call on them, or write Fairbanks, Morse & Co., Chicago 5, Ill.**

**FAIRBANKS-MORSE,**

***a name worth remembering***

**RAILROAD EQUIPMENT • RAIL CARS • PUMPS • SCALES • ELECTRICAL MACHINERY • DIESEL AND DUAL FUEL ENGINES DIESEL LOCOMOTIVES • MAGNETOS**



# MOST LARGE USERS *of the* JACKSON MULTIPLE HAVE *RE-ORDERED* AGAIN and AGAIN

and that, to our way of thinking, is mighty good evidence that it can't be beat for major ballasting operations . . . either in time, minimum cost, or quality of track produced. It is the only multiple tie tamper that actually tamps the "vital spot" — ***the load-bearing zone directly beneath the rail; that will give you a perfect job in one operation (no follow-up of any kind required) regardless of the type of ballast used; that will do a good job of smoothing in those operations in which there is little lift and no new ballast is spread.*** And we have yet to see conditions in which a Jackson Multiple cannot be made to save considerably more than its purchase price during a single season.

Obviously it's cheaper to own them than to get along without them. Moreover, they will enable you to get your work done without paying overtime. Now is the time to put them into your budget if you haven't already done so. We would be glad to send one of our thoroughly practical field men to discuss them with you, and, if you like, put a Jackson Multiple Tie Tamper on your track on a rental basis, to show you exactly what it will do for you. We warn you, however, that the latter method nearly always shakes the prospect out of his tree. Drop us a line, won't you?

# No More *Trenching!*
# No More *Jacking up Track!*

# *This* WOOLERY
## *Tie-removing Team Now Eliminates This Slow, Costly Method!*

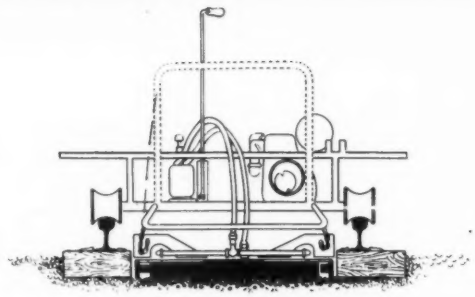
Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

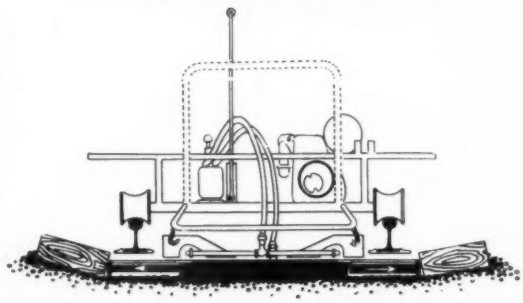
The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!* See how simply and efficiently this WOOLERY team works—follow the "1-2-3-" steps of tie-removal.

1. After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.

2. A double-ended hydraulic cylinder is then lowered into the tie bed.

3. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.





There has been no trenching or jacking up of track—thus line and surface of track are maintained, soft spots and humpy track are eliminated—the new tie rests on a firm bed and little or no tamping is necessary!

SINCE 1917 RAILWAY MAINTENANCE EQUIPMENT

**Woolery MACHINE COMPANY**

2919 COMO AVE. S. E. MINNEAPOLIS 14, MINN.

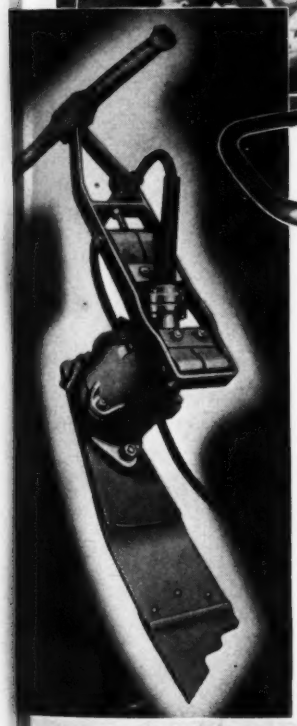
*Exclusive Export Representatives*

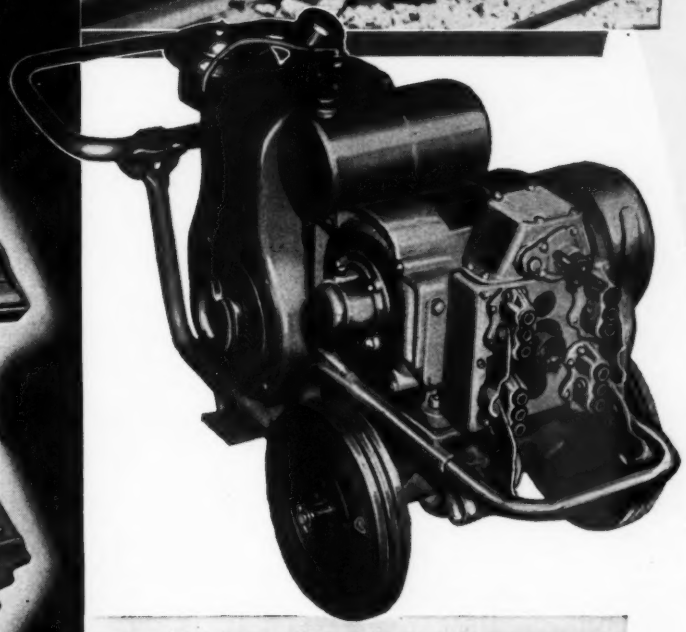
PRESSED STEEL CAR CO., NEW YORK, N. Y.

## SPECIFICATIONS

- ENGINE Wisconsin air-cooled 4-6 H.P.
- PUMP 1,500 P.S.I. built-in relief valve, 1 gal. reservoir.
- DRIVE Double V-belt.
- CYLINDER 3" bore, honed finish, double-ended, double-acting. Hardened, ground and chrome plated rams equipped with rod wipers.
- TRACK ROLLERS 6" self-centering, insulated.
- NET WEIGHT 360 pounds.
- CRATED WEIGHT 490 pounds.

# JACKSON UNIT TIE TAMPERS





## Excellent

## MEANS OF REDUCING SECTION GANG COSTS and LABOR SHORTAGE!

In giving your section gangs the leverage of mechanization, provide them with JACKSON VIBRATORY TAMPERS — not only because they are the fastest and most reliable, but also because with their quickly interchangeable tamping blades for all lifts of track and kinds of ballast, your supervision and tamper operators have at their immediate disposal a machine specifically adapted to the work in hand. The ideal section gang outfit is our M-2 Power Plant and 2 to 4 tampers. The power plant is easily portable, readily handled by even the smallest gang. It generates both single-phase and 3-phase 115 volt, 60 cycle AC and may be used for lighting, emergency signaling, and operating other power tools.

## And ALSO PROVIDING FOR TOP-NOTCH EXTRA GANG OPERATION!

With JACKSON 4-Tamper outfits on your sections you are also well equipped for extra gang operations, for they may be grouped for any major ballasting job with results that are exceeded only by the JACKSON Multiple Tamper. Let us tell you more about them.

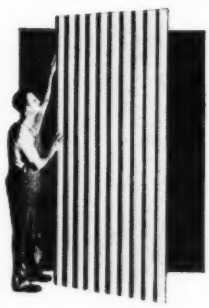
**ELECTRIC TAMPER**
**& EQUIPMENT COMPANY**

# Built to save money... Built to last...

**Diesel engine house** of the Seaboard Air Line Railroad shows how Corrugated Transite was used in combination with glass to provide an attractive, maintenance-free exterior.

**Interior view** showing type of construction used. The office (right foreground) is built with flat Transite sheets.

## . . . with asbestos-cement CORRUGATED TRANSITE*



FOR MODERN, ATTRACTIVE, low-maintenance diesel shops . . . the nation's leading railroads are building with time-tested Corrugated Transite.

This Johns-Manville asbestos-cement product is moulded under pressure into fireproof, rustproof, and rotproof sheets that never require paint or other preservative treatment . . . are virtually maintenance-free. Important, too, in structures housing diesel equipment, they will not absorb oil-laden exhaust fumes which might create a fire hazard.

Construction is fast, too, because Corrugated Transite comes in large sheets (from 3 to 11 feet long, 42 inches wide) that cover large areas quickly. It is easy to cut or drill . . . requires only a minimum of framework . . . and can be readily fastened to either steel or wood.

You will find Corrugated Transite equally adaptable for roofing or siding—on either new or remodeled structures. It can be used alone, or in combination with other materials such as brick, glass or stone.

Save money in the housing of *your* diesel equipment by building with Corrugated Transite. Write for further details to Johns-Manville, Box 290, New York 16, N. Y. In Canada: 199 Bay Street, Toronto 1, Ontario. Ask for Brochure TR-45-A.

*REG. U. S. PAT. OFF.

JOHNS MANVILLE JM PRODUCTS **Johns-Manville**

**94 YEARS OF SERVICE TO TRANSPORTATION**

# EARNS ITS KEEP
## . . . January or June!

HELPING keep Upper Peninsula commercial rail travel on schedule is just one of many chores for this "Caterpillar" D2 Tractor with matching No. 2A Bulldozer. Here the Duluth, South Shore & Atlantic Railroad Co. is using this rig to clear snow and ice from tracks and depot platforms in the station yard at Calumet, Michigan. When it's needed at other key depots, it's easily transported on a flat railcar.

"Cat" Diesel Tractors with matching "Cat" Bulldozers have proved themselves just about the handiest teams you can use on the right of way. You can keep them busy twelve months a year on many vital maintenance tasks, for instance — daylighting cuts, widening drainage facilities, building up fills, as stand-by units on wrecking trains and on switch and spur roadbed construction. What's more, they're so sturdily built, they seldom need a "breather."

As every railroad man knows, good care means longer wear. Even the best machines are better for attention. The defense effort demands that your equipment last longer. With "stitch-in-time" inspection, you can add many extra working hours to the life of "Caterpillar" equipment!

**CATERPILLAR,** PEORIA, ILLINOIS

**CATERPILLAR**
REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

# EXTRA EMPLOYEE

# RACINE *Unit* TIE TAMPER

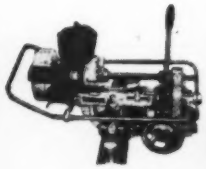
If you had an extra man working eight hours per day, you'd notice the increase in tamped track. A Racine Unit Tie Tamper provides that increase — GIVING YOU THE EQUIVALENT OF EIGHT HOURS MORE WORK EVERY DAY.

Racine Unit Tie Tampers speed up your work and increase manpower efficiency by reducing fatigue. Easily carried, easily operated, shock-free — they team up productively with your operators.

You get longer tool life with less machine maintenance, more uniformly compacted ballast that remains properly placed longer. All these are extras that make the Racine Unit Tie Tamper a valuable employee to serve you capably for a long, long time. Write for free 3-color catalog.

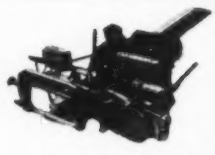
- LIGHT IN WEIGHT (60 lbs.)
- SHOCK-FREE OPERATION
- 1500 BLOWS PER MINUTE
- EASY STARTING MAGNETO IGNITION
- BALANCED RECOIL—SMOOTH ACTION
- LOW MAINTENANCE COST
- 80% IMPROVEMENT IN TOOL LIFE
- LONG TROUBLE-FREE LIFE

OTHER PORTABLE MACHINES BY RACINE



Racine Bond Drill

Racine Rail Drill

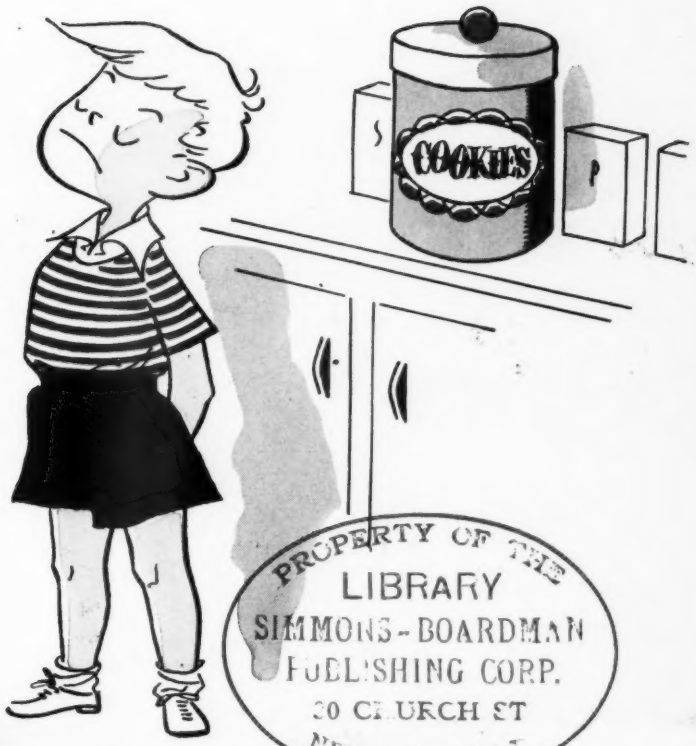


Racine Rail Cutter

## RACINE

TOOL AND MACHINE COMPANY

1738 State Street, Racine, Wis.

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Pittsburgh **Brush Killers**

# have *SELF CONTROL*, too!

You can count on PITTSBURGH Brush Killers to concentrate and confine their killing action to the sprayed areas only. This "self control" is the result of the low volatile Tetrahydrofurfuryl Esters (THFE)† which all PITTSBURGH Brush Killers now contain.

For ease and economy of use, plus this NEW safety to nearby valuable crops, use PITTSBURGH Brush Killers.

†*U. S. Patent Pending*

**10-20 BRUSH KILLER:** General farmland clearance.

**BRUSH KILLER 22:** Rangeland clearance, rights-of-way.

**LO-VOL 4:** Mesquite, briars, hard-to-kill woody growth.

*Standard for Quality*

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**ORGANIC INSECTICIDES:** Benzene Hexachloride, Toxaphene, Dichloro Diphenyl Trichloroethane, Aldrin, Dieldrin, Chlordane. **ORGANIC PHOSPHATE INSECTICIDES:** Parathion Wettable Powders, Parathion Liquid Concentrate, Metacide. **WEED KILLERS:** 2,4-D Acid, 2,4-D Amine Concentrates, 2,4-D Ester Formulated Concentrates, 2,4-D Sodium Salt Monohydrate, 2,4,5-T Formulations. FUNGICIDES, SEED DISINFECTANTS, COTTON SPRAYS AND DUSTS, AND OTHER SPECIAL AGRICULTURAL CHEMICALS.

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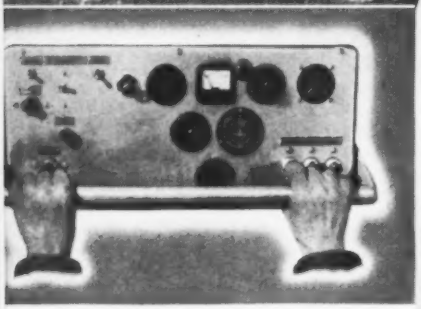
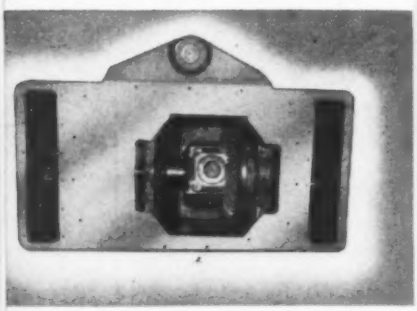
# Rubber-tired D Roadster TOURNAPULL

## goes anywhere to speed rail maintenance



Dashboard switches control steering and scraper operations . . . put power at point of action . . . give faster, more accurate control. Gear shift lever, foot brake and accelerator complete simple control system. Operators can be trained in a few hours.



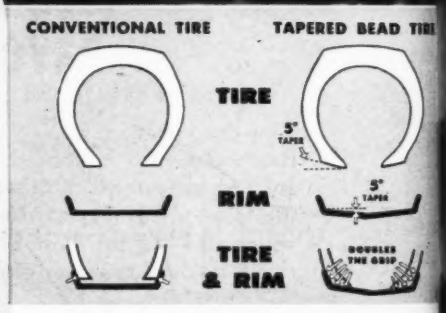
Revolutionary Tournamatic differential and powerful final drive keep "D" rolling through mudholes or over slippery grades where other units stall. Result: less weather downtime, longer work season, more roadbed serviced, lower cost maintenance.

## 3 TO 4 TIMES FASTER THAN CRAWLER RIGS!

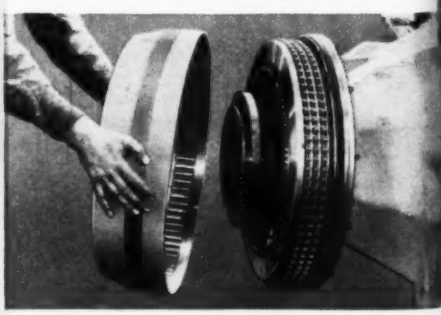
Careful selection of off-track tools pay off in holding down costs on right-of-way maintenance. D Roadster Tournapull, LeTourneau's 28 m.p.h., 9-ton capacity "maintenance handyman" gives you a one-man machine that goes anywhere *fast* to maintenance assignments. It handles scraper dirt 3 to 4 times faster than average crawler rigs, self-loads, or can be pusher-loaded for big production on fleet operation. Even more important is its go-anywhere ability . . . via highway, down the track, along the right-of-way. Big tires easily cross rails or curbs without blocking, can drive safely over trestles, across yards, over blacktop, through mud, sand, soft fill where other units bog down.

Here is the best RR maintenance dirtmover ever offered. Gets more jobs done, faster, easier, with less manpower. Eliminates delays in maintenance service, eliminates delays to rail traffic, eliminates headaches of supervision, dispatching and management. Check money-saving applications illustrated, then write for detailed, job-proved performance data on type of work you have in mind.

**R. G. LeTOURNEAU, INC.**
PEORIA, ILLINOIS




Big 63½" high x 20" wide tires, with normal operating pressures as low as 40 lbs., provide extra flotation in extremely soft going. The 5° taper doubles tire-to-rim grip . . . prevents tire slipping . . . assures long, economical tire life . . . makes retreading practical.



4-wheel air brakes with 719 sq. in. of braking surface per wheel, or total of 2876 sq. in., assure quick, safe, sure stops . . . require minimum maintenance . . . improve maneuverability . . . give operator confidence for faster operation on all footings.

**Handles to 7 cu. yds. gravel, ballast, cinders**—One-man "D" loads, hauls, and spreads in one operation over long or short distances. Digs from pit or stockpile . . . no big, expensive loading unit or special spreading tools needed. Works any length haul independent of work-train service.

**Stockpiles coal, dozes, push-loads other units**—With dozer blade on front, "D" eliminates need for odd-job bulldozer . . . stockpiles coal . . . push-loads other "D's" on fleet operation . . . handles emergency dozing . . . backfills trenches . . . pushes dirt around culverts . . . gives help to short-handed section crews.

**Crosses tracks, curbs, pavement on job-to-job moves**—speeds to job at 28 m.p.h. clip . . . goes right to work, with no loading delays. Big, soft-cushion 18.00 x 25 tires deflect load evenly over obstructions.

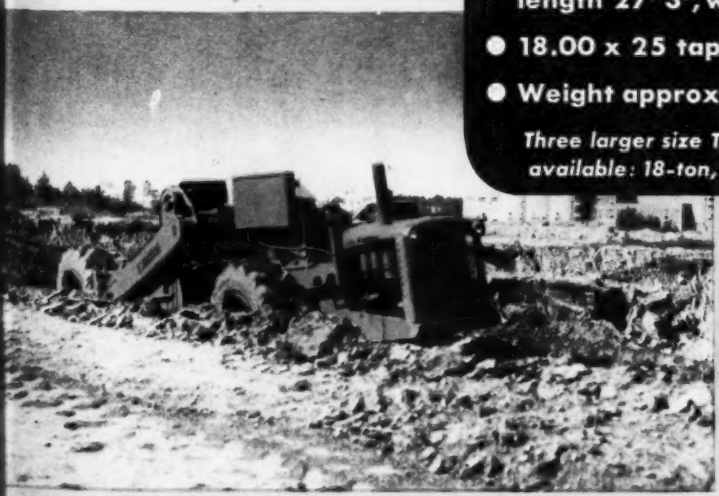
## SPECIFICATIONS

D Roadster with E-9 Carryall Scraper

- Capacity 9 tons - 7 cu. yds.
- 5 speeds forward to 28 m.p.h., 122 h.p. diesel
- Fingertip electric control
- Positive, power steer
- Heavy-duty transmission, sliding gear type
- 90° turn—min. turning radius 13'
- 4-wheel air brakes, 2876 sq. in. total braking surface
- Overall dimensions — length 27' 3", width 8' 3"
- 18.00 x 25 tapered bead tires
- Weight approx. 22,450 lbs.

*Three larger size Tournapulls are also available: 18-ton, 35-ton and 50-ton*

**Digs, cleans ditches . . . widens embankments**—new high-speed method of maintaining ditches, practically eliminates extra finishing. On this job, "D" self-loaded 5 pay yds. top soil, clay, silt in 1 min.



**Builds, relocates grades for sidings, spurs, main lines**—"D" works on grade or drainage jobs singly, or in fleets, with or without pusher. In slippery going, Tournamatic differential automatically delivers up to 4 times the tractive effort of slipping wheel to wheel on firmer footing.

Tournamatic, Tournapull, Carryall—Trademark Reg. U. S. Pat. Off. R R 20

**Plows snow in yards, access roads**—Easily mounted V-Type Snow Plow changes "D" into efficient snow plow... correctly curved blade, plus plenty of power, smashes deep drifts . . . opens yards, sidings, loading tracks, access roads. Scraper can load and haul snow and ice from yards.

*Send Now to:* **R. G. LeTOURNEAU, INC., Peoria, Illinois** Tell us more about 9-ton, 122 h.p. D Tournapull . . . .

also data on:

NAME..... TITLE..... ☐ 18-ton

COMPANY..... ☐ 35-ton

STREET..... CITY..... STATE..... ☐ 50-ton

LeTOURNEAU LET EQUIPMENT

# ANTI-CHECKING IRONS

## make sure of every tie at 1/4 the cost!

● With Sharon Crinkle-ribbed anti-checking irons you can make sure of every tie at an average cost (materials and labor) of 10 cents per main line tie.

Based on thorough tests by a prominent eastern railroad*, this is approximately **¼ the cost of alternate methods.**

**PERMANENT ANTI-CHECKING**—The ribbed surfaces on Sharon Crinkle-ribbed irons are designed to hold the iron in place, despite vibration and severe service. In 15 years of operation on this railroad, only one crinkled iron vibrated out. So once installed, you can be sure of anti-checking irons for the life of the ties themselves.

**COMPARE THE COST**—Get permanent anti-checking insurance on every tie—at far less cost. We'll be glad to show you the dollars and cents figures . . . obtained from impartial sources.

*Name of railroad on request.

**Complete Strapping System, Engineering, Steel Strapping, Tools and Accessories, Anti-Checking Irons.**

*For further information, write*
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**GRISWOLD STREET, WARREN, OHIO**

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SHARONSTEEL
STEEL COMPANY

**STEEL STRAPPING DIVISION**

# Cummins® Diesels do so many jobs... so much better

**...because they're custom-built to fit the job!**

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*Industrial locomotives, cranes, shovels*

*Logging yarders and loaders, crawler tractors*

*Drilling rigs, centrifugal pumps, generator sets*

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*Lightweight, high-speed Diesels (50-550 hp) for these and many other uses*

**...because they're**

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Need rugged power? Then you need lightweight, high-speed Cummins Diesels, custom-built to fit your needs. Each engine is built *twice*. It's assembled, run-in tested, disassembled and inspected, then reassembled and tested again. Consider Cummins' craftsmanship; the exclusive Cummins fuel system; our efficient and expanding parts and service organization: These all add up to minimum "down-time", more power and profit for the user. See your Cummins Dealer.

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CUMMINS Dependable DIESEL

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**CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA**

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# Hold Grade Levels

## Yet put up to 18" of CLEAN BALLAST UNDER TIES

Matisa Ballast Cleaner is the ONLY machine capable of thoroughly cleaning ALL BALLAST—beneath ties as well as in cribs. Note that digging teeth pass clear under ties and rails, doing a COMPLETE job.

### BEFORE *Matisa* CLEANING

### AFTER *Matisa* CLEANING

Whether to hold grade levels on dirty ballast, or provide a clean ballast cushion with a grade raise has long been a major maintenance of way headache. Now, with the Matisa Ballast Cleaner, you can hold the grade level (or *lower* it), yet put as much as eighteen inches of thoroughly cleaned ballast under ties!

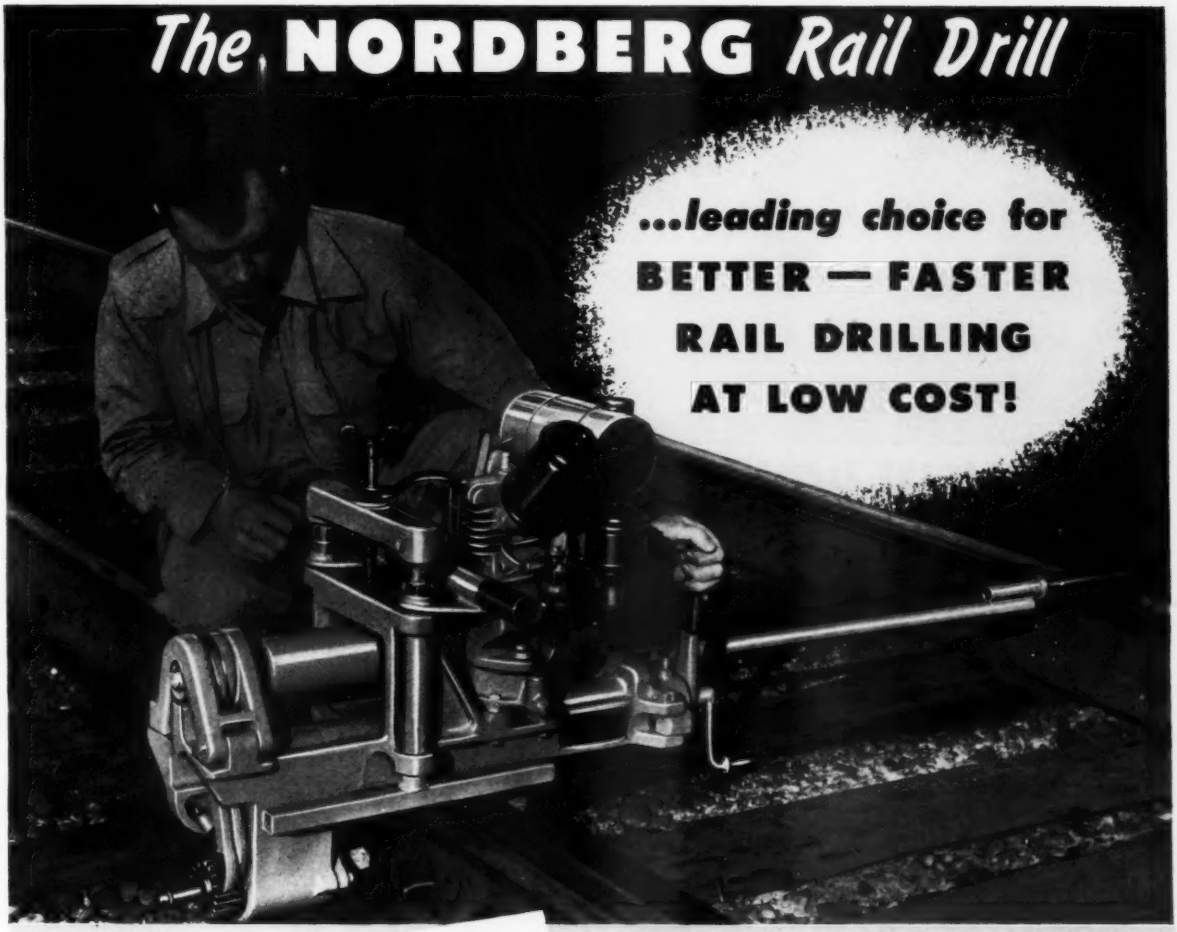
Matisa cleaning—and *only* Matisa—solves the common grade problems at crossings, underpasses and in yards... And used with the Matisa Tamper, produces roadbed that is *better than new-laid track* put down with other ballasting methods.

Matisa Ballast Cleaners are furnished on a supervised rental basis for cleaning 1,000 feet or 1,000 miles of your track . . . rapidly, efficiently and *completely.* Write our M. W. Engineering Department for details on 1951 Cleaner availability.

**THE MATISA EQUIPMENT CORP.**
**224 South Michigan Blvd. • Chicago 4, Illinois**

ALL OVER THE WORLD *Matisa* TRACKWORK SPECIALISTS

# The NORDBERG Rail Drill




## ...here are 6 reasons why:

**1 EASILY SET UP**—No part of machine rests on ties or ballast. High ballast, ice, snow, or unequal tie level are no problem. Correct drilling location instantly obtained from top of rail.

**2 HEAVY DUTY PERFORMANCE**—Although light in weight, simplicity of design and quality construction make this drill more rugged than heavier models.

**3 LIGHTWEIGHT**— Through use of aluminum frame and other special design features, total weight is only 132 pounds.

**4 VERSATILE**—14 inch spread permits drilling at switch heels, frogs and guard rails.

**5 CHUCK SIMPLICITY**—No tools required to install or remove bit.

**6 LOW PRICE**—Justifies locating a Nordberg Drill even at points where only occasional holes are drilled.

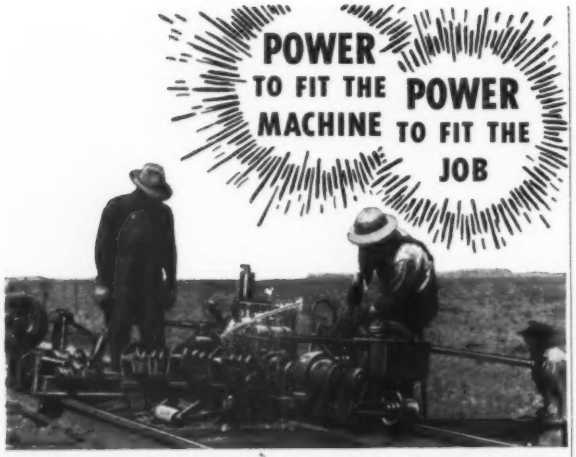
Investigate your hand drilling costs. Check them against the Nordberg Model CD which drills a 1⅛ inch hole in less than a minute. You just can't *afford* to waste valuable man hours drilling bolt holes in rail by hand methods. *Write for Bulletin 157.*

**Have you seen our RAIL DRILL *BIT SHARPENER*? For full details, write for *BULLETIN* 192.**

R152

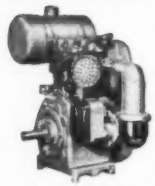
**Look to NORDBERG** . . . *for continually improved* TRACK MAINTENANCE MACHINERY *to do a Better, Faster Maintenance Job at Lower Cost*

NORDBERG MFG. CO., Milwaukee, Wisconsin

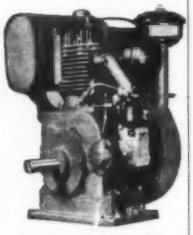


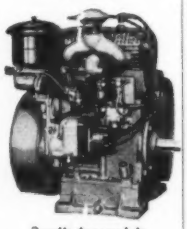

# WISCONSIN-POWERED
## Fairmont Tie Inserter

Replacing old ties with new ones takes less time than ever . . . with the aid of Fairmont equipment. A special machine removes the old tie. Then this second unit . . . a Wisconsin-powered Tie Inserter . . . goes to work. It pulls the new tie firmly and smoothly into place. Both units are made by Fairmont Railway Motors, Fairmont, Minn.


Single-cylinder models, 3 to 6 hp.

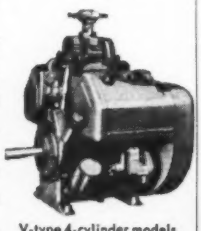
No engine power approaches Wisconsin Power, 3 to 30 hp., in showdown tests against the rigors of railway maintenance service. These features are *behind* such *far ahead* performance: The crankshaft always rides easily and trouble-free, supported by tapered roller bearings . . . no danger of bearing failure. Cooling, too, is best, summer and winter, when you depend on air alone. And the OUTSIDE magneto, with impulse coupling, offers you *more* than easy servicing . . . you get quick starts and steady running always, rain or shine, cold weather or hot.


Single-cylinder models, 6 to 9 hp.


2-cylinder models, 7 to 13 hp.

Make the *most* of your power possibilities by putting the *Most* HP. Hours Of Service Into Every Job . . . SPECIFY WISCONSIN.

And write for details about 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 30 hp.


V-type 4-cylinder models, 15 to 30 hp.

MOST H.P. HOURS

**WISCONSIN MOTOR CORPORATION**

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46 WISCONSIN

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# SPOT TAMPING BY *Specialized Gangs*

## . . . with air power from self-propelled

# Le Roi TRACTAIR

## is Faster, More Uniform, Costs Less

**Le Roi Tractair** is a combination 35-hp wheel tractor and 105 cfm compressor. That's why it's so versatile — why it can easily and quickly take money-saving air power anywhere.

*Just take a look at the many advantages Le Roi Tractair gives you:*

**Quick, Sure Starting** — continuous, dependable operation.

**Plenty of Air** — enough to run eight Le Roi-CLEVELAND or other conventional Tie Tampers.

**Ample Wheel Base and Clearance** — permits safe crossing of tracks.

**Low Center of Gravity** — can climb embankments and work on slopes with safety.

**Self-Propelled Mobility**—plenty of power and traction to get around. Takes your air supply wherever it's needed.

**Off-Season Uses**—snow plowing—tractor adaptable to work of B&B—Signal—T&T — and Water Service Departments.

**Many Useful Attachments Available** — Front-end loaders — backhoe — backfill blade — winch — snow plow — utility boom and air motor for driving earth augers, mower attachments, etc.

Tractairs have now been in railroad service for five years with completely satisfactory results — we know — we service all of them.

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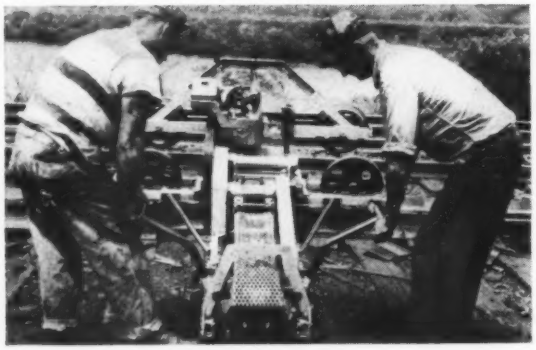
# *A* **BETTER** *way to CLEAN CRIBS . . .*



# *NEW* RTW P-46 BALLAST EXTRUDER

For lowering ballast in cribs before adzing ties, this new RTW machine embodies design and operating features that help speed rail replacement jobs and keep down costs. Rugged teeth mounted on an engine-driven endless chain speedily remove ballast to intertrack spaces or to shoulders without damaging ties. Cribs are cleaned to a uniform level, thus avoiding formation of water pockets.

Simple, compact design makes the RTW P-46 Extruder easy to move along track to and from location. A counterbalancing feature minimizes effort required by operator to raise and lower operating head while machine is in use.

Be sure to call or write immediately for full description and prices on this time- and cost-saving unit.

**Railway Trackwork Co.**

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Distributors for

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*Lewis* **sealtite**

## hook bolt

A highly dependable, superior bolt used in bridge and trestle construction. Forged from S.A.E. 1045 steel. Patented fins prevent turning. Sealtite washer nut adds strength, stops seepage. *Available in Hot-Dip Galvanized finish for greater durability and economy.*

Used by 85% of America's Class I Railroads.

Also available with std. sq. and hex. nuts.

*See your Lewis representative, or contact factory for samples, prices, full details.*

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MINNEAPOLIS 14, MINNESOTA

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Engineering officers will want a copy of the new Twelfth Edition of WHO'S WHO in RAILROADING. Here they will find complete and up-to-date biographical information on all of the key men in the railway industry. More than 6,000 of these men are in the new edition, 2,000 for the first time.

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# Inspection car checks the track; TIMKEN® bearings check the wear

TO help keep this enclosed inspection car in top operating condition at all times, Kalamazoo Manufacturing Company uses a total of 12 Timken® bearings in the wheels and the reverse transmission.

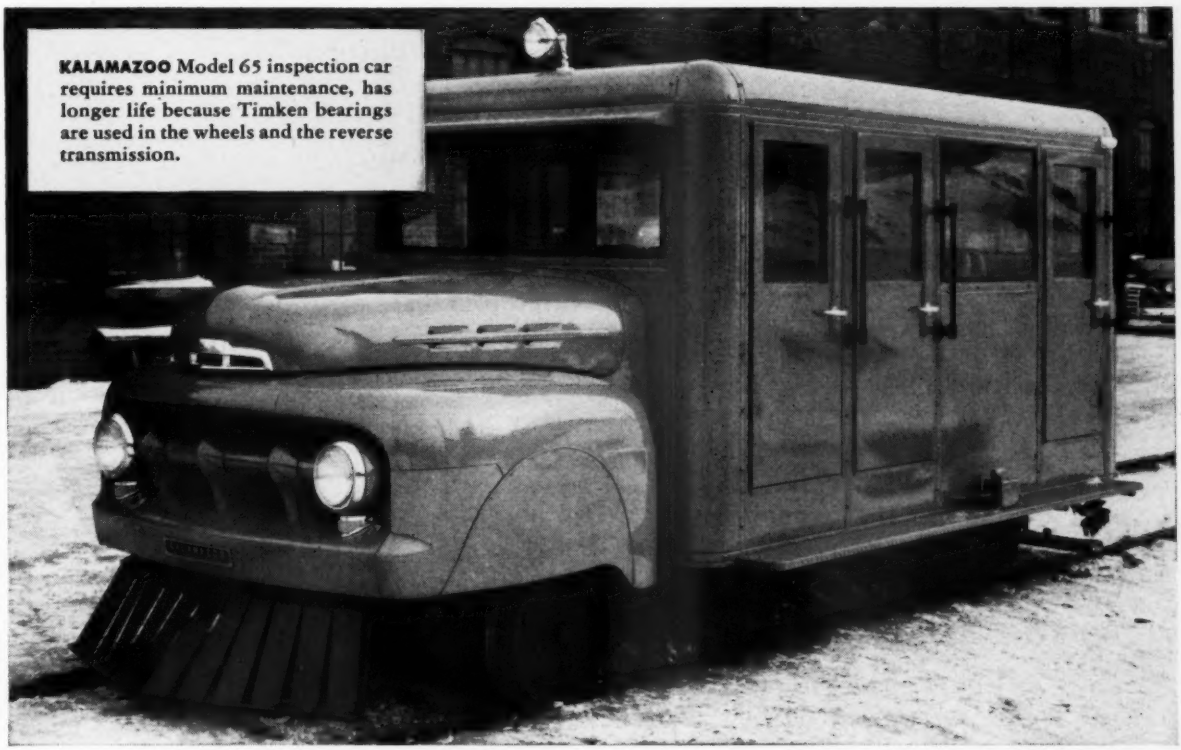
Timken tapered roller bearings operate freely, frictionlessly because of their true rolling motion and the smooth surface finish of rollers and races. Friction is practically negligible and, as a result, wear is held to a minimum.

Proper gear meshing in the reverse transmission is assured because Timken bearings take radial and thrust loads in any combination, hold shafts in rigid, positive alignment.

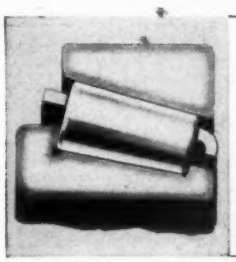
In addition to these advantages, Timken bearings have extra load carrying capacity because of line contact between rollers and races. And, they save maintenance time and dollars because they require less frequent lubrication.

No other bearing gives you all the advantages you get with Timken bearings. Be certain they are in the equipment you buy or build. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

*This symbol on a product means its bearings are the best.*



**KALAMAZOO** Model 65 inspection car requires minimum maintenance, has longer life because Timken bearings are used in the wheels and the reverse transmission.



**GREATER LOAD AREA**

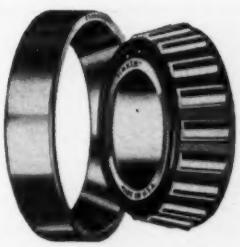
Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

**TIMKEN**

TRADE-MARK REG. U. S. PAT. OFF.

**TAPERED ROLLER BEARINGS**



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →✳←

## REHABILITATE YOUR OLD PIPE LINE AT MUCH LESS THAN THE COST OF A NEW LINE

**Without appreciably disturbing present service** . . . you can get new pipe line performance from old cast iron or steel pipe line. Line that pipe to give a new, continuous, smooth-surface. Ask PIPE LININGS, INC. to use the patented processes that apply cement mortar lining quickly to pipe line interiors... with only momentary interruption to install sectional by-pass lines. You can do it at much less than the cost of installing a new pipe line. Write TODAY!

**Tate process used on Line 4" to 16". Centriline Process used on Line 16" to 144".** Consult our hydraulic engineers . . . they are at your service.

BEFORE | AFTER

**CEMENT MORTAR LINING WILL . . .**

Protect against discoloration and contamination
Protect against corrosion
Improve flow coefficients
Prevent leakage
Reduce maintenance costs
Reduce pumping costs

**PIPE LININGS, Inc.**

*A subsidiary of*
American Pipe and Construction Co.
**4675 Firestone Blvd.**
**South Gate, California**
(In the East—CENTRILINE CORP., 140 Cedar St., New York 6, N.Y.)

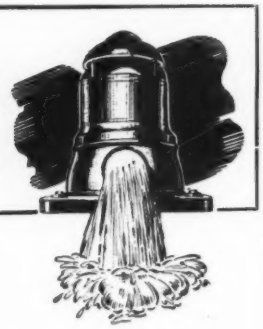
PIPE LININGS INC.
4675 Firestone Blvd., South Gate, Calif.
Please send complete information on how we can obtain new pipe line performance from our old line.

Name_____

Address_____

City_____ Zone____ State____

## WATER



**FROM THE GROUND BELOW YOU**

IN single or multiple units, Layne well and pump installations produce tremendous quantities of water at extra low cost. High efficiency designing, precision building and advanced methods of installation make Layne wells and pumps a highly practical and fully justified investment. Layne does the job complete; drills the wells, furnishes all casing, shafting, pumps, motors and sand screen. After complete testing, the system is delivered to you in perfect operating order.

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**LAYNE & BOWLER, INC.**
**General Offices, Memphis 8, Tenn.**

Layne **WATER SUPPLY WELLS & PUMPS**

## AGRICAT SAVES

**time—expense—manpower**

Cleans under bridges and large culverts, in ditches and cuts, BETWEEN RAILS. Cleans coal spillage, cinders, sand. Pulls cable. Digs fire-breaks. Backfills. Levels dirt and weeds on berm outside ballast section; cuts away cinder and ballast. Cleans snow from platforms, drives and narrow congested areas. Pushes 9 cu. ft.

● Spring Loaded Friction Clutch & Brake Combination ● Small but powerful! ● Welded steel frame ● Easy to handle!

**DIMENSIONS:**

Width—38 in.
Length—58 in. tractor only; 6 ft. with dozer
Height—41 in.
Weight—1160 lbs. tractor only
Engine—8¼ h. p. air-cooled Briggs & Stratton
Treads—Steel or rubber

**Rotary Broom Attachment Also Available.**

**EARL H. PENCE & CO., Inc.**
**2150 Washington Ave., San Leandro, Calif.**

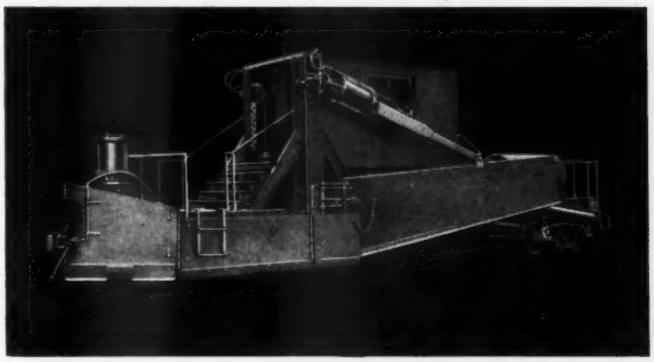
# 3 GOOD ANSWERS—

## TO ROADBED MAINTENANCE PROBLEMS

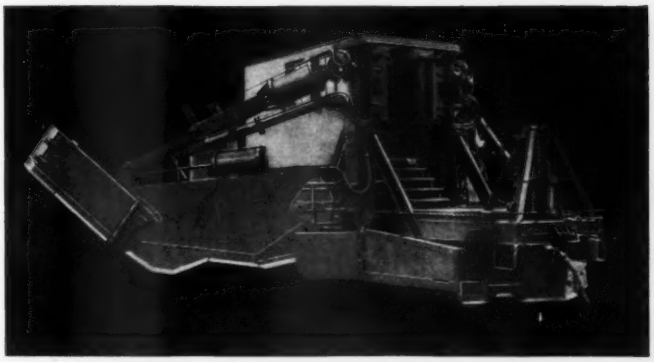
The complete Jordan spreader-ditcher-snow plow line offers you a year-around solution to every roadbed maintenance and snow romoval problem: ballast plowing, roadbed shaping, ditch cutting, fill spreading, bank widening, shoulder dressing, ice cutting and track flanging.

Plan to watch a Jordan in action and you'll see why so many railroad men say "It does the work of an army of men."

SPREADERS—



DITCHERS——



SNOW PLOWS—

**O. F. JORDAN COMPANY**

WALTER J. RILEY, *Chairman of the Board*

EAST CHICAGO, INDIANA

# BARCO

LOW FIRST COST!

LOW MAINTENANCE COST!

## TYTAMPER

YEARS of experience throughout the country have proved the superiority of BARCO UNIT "TYTAMPER" — It's still the *BEST!* Check these points:

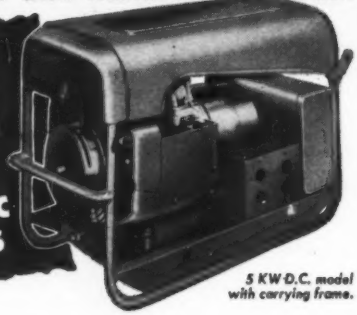
- Heavy enough to go through cemented ballast —but still light and easy to handle.
- VERSATILE—excellent for work on cross-overs, interlocking switches, breaking ice or frozen cinders.
- No hose or auxiliary equipment. Low cost, economical. *Let us give you the complete story.*

**BARCO MANUFACTURING CO.**
1805 Winnemac Ave. • Chicago 40, Illinois

# Cut Costs, Speed Work

## on Construction and Maintenance Jobs!

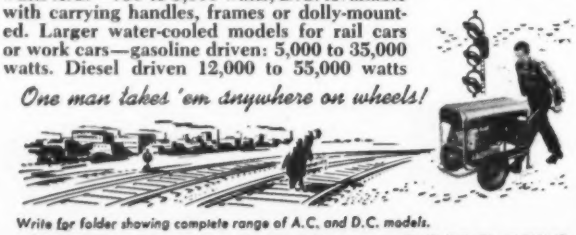
with **ONAN** *Portable* **ELECTRIC PLANTS**



*5 KW D.C. model with carrying frame.*

Take an Onan portable electric plant to every right-of-way maintenance of construction job! It will supply quick "plug-in" electric power for cost-cutting, fast working electric tools—drills, saws, nut runners, grinders, pipe threaders or any motor-driven equipment. Lightweight models from 400 to 3,000 watts A.C.—750 to 5,000 watts, D.C. Available with carrying handles, frames or dolly-mounted. Larger water-cooled models for rail cars or work cars—gasoline driven: 5,000 to 35,000 watts. Diesel driven 12,000 to 55,000 watts

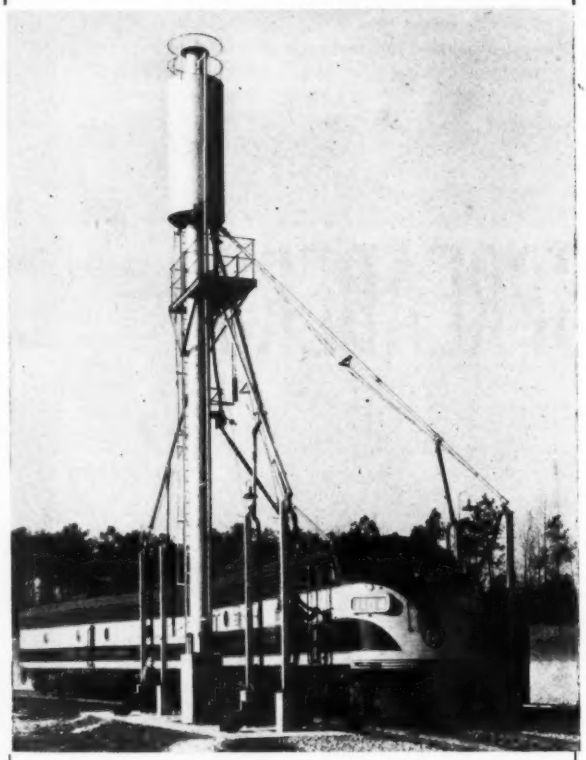
*One man takes 'em anywhere on wheels!*



*Write for folder showing complete range of A.C. and D.C. models.*

**D. W. ONAN & SONS INC.**
4581 University Ave. • Minneapolis 14, Minn.

# SAND HANDLING, DRYING, AND STORAGE PLANTS — FOR DIESEL LOCOMOTIVES



BY AMERICA'S FOREMOST DESIGNERS AND BUILDERS OF SUCH PLANTS.

•

THE ACQUISITION OF A FINE OPERATING DIESEL SAND PLANT, AS ABOVE, WOULD INDICATE AN ACHIEVEMENT BY A DISCRIMINATING RAILROAD CHIEF ENGINEER.

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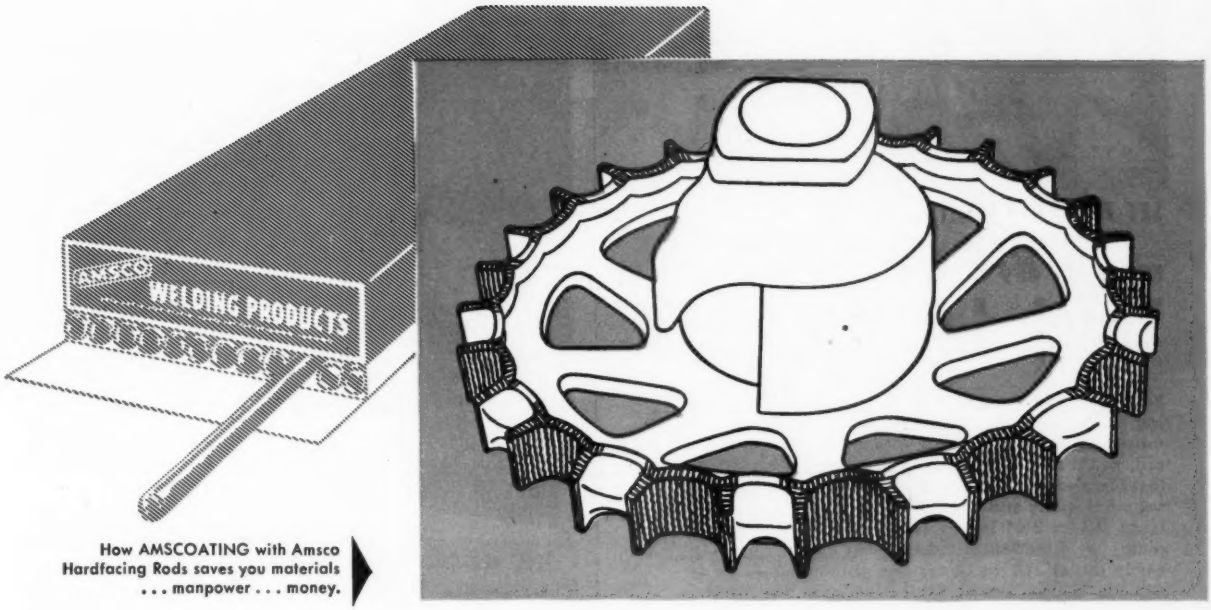
## ROSS AND WHITE COMPANY

CHICAGO DAILY NEWS BUILDING, CHICAGO

CLYDE P. ROSS, *President* • DAVID E. WHITE, *Vice-President*

CARLETON P. ROSS, *Contracting Engineer*




How AMSCOATING with Amsco Hardfacing Rods saves you materials . . . manpower . . . money.

# These teeth take bites out of repair costs!

## AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion . . .

***Find out how AMSCOATING can save you materials . . . manpower . . . money!***

## *AMSCOATING can make old Tractor Drive Sprockets last 3 times longer than new.*

Here's another way to beat the high cost of replacements, down-time and maintenance . . . AMSCOATING the teeth on Tractor Drive Sprockets. Time after time service records have shown that AMSCOATING of sprockets results in these dollar-saving advantages:

1. ***On an average — 3 times the service life of a new, unhardfaced sprocket.***
2. ***2 out of 3 sprocket changes completely eliminated . . . far less down-time, less maintenance . . . more equipment out of the shop and on the job.***

To top it off, sprocket replacements can practically be eliminated. An AMSCOATED sprocket can be reclaimed over and over again . . . *at about half the cost of a new one!*

Get all the facts on how to make these big savings . . . write today for instruction sheet on AMSCOATING sprockets, and the name of your nearest AMSCO Distributor.

**AMSCOATING**

*THE RIGHT WAY TO SAY HARDFACING*

AMERICAN Brake Shoe COMPANY

**AMERICAN MANGANESE STEEL DIVISION**

398 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.

SET FIRMLY — STAND STRAIGHT

FOR THE *"BIG LIFT"* IN

# Track Jacking

For track maintenance, including surfacing, lining, tamping-ballasting, tie plate renewal, and in conjunction with welded rail, you'll find—among other features—that Simplex Aluminum Alloy Track Jacks set more firmly and stand straighter. The large 2½" x 3¼" forged (not a welded plate), machined toe gives the "big lift" easily under rail or under ties without damage. Sturdy, lightweight, Aluminum Alloy housings are reinforced at all stress points. Greater bearing area of rack bar on housing gibs reduces wear. Simplex Jacks lift full capacity on toe or cap.

**SIMPLEX 16A**
Full 6" lift—highest of any surfacing jack. Minimum toe height 1½". Eliminates ballast removal; less digging in under-tie work. Trips from right or left. Improved safety thumb guard. Capacity 15 tons; weighs 45 lbs.

**SIMPLEX A5**
Capacity 15 tons; weighs only 28 lbs. 5" lift.

**SIMPLEX A17**
Capacity 15 tons; weighs only 41½ lbs. 13" lift.

Simplex LEVER • SCREW • HYDRAULIC **Jacks**

Write for Bulletin: Track 49

TEMPLETON, KENLY & CO.

1026 South Central Avenue • Chicago 44, Illinois

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1 and 2 show parapet wall and coping before and after Roof-Shield treatment.
3 Alligatored roof before and after applying Roof-Shield.
4 Spray application of Roof-Shield.

## OLD ROOFS "RETREADED"

ADDEX ROOF-SHIELD—Liquid Asphalt reinforced by Glass-Fiber-Mesh.

- A Complete Package.
- Seals old roof flashings and parapet walls.
- Easy to apply. Ready to use. Light weight.
- No heat or special tools required.
- Applied cold to existing surfaces.
- No blistering. No alligatoring. No delaminating.

*Write for descriptive literature and specifications.*

**ADDEX** CORPORATION

10318 WILBUR AVE. • CLEVELAND, OHIO

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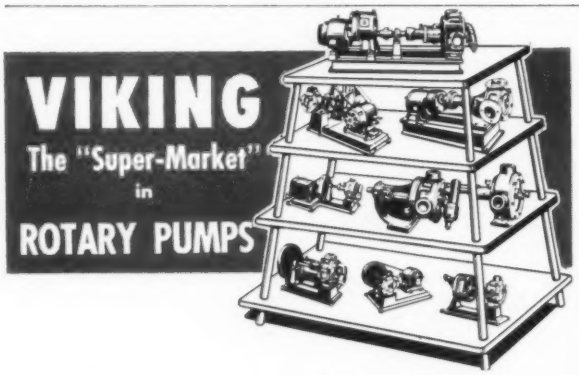


**The range in size and style of Viking pumps truly parallels the range of items found in today's super-market.**

**When you specify Viking, there is no compromise. They fit the job at hand.**

**Nowhere else can this *complete line of rotary pumps* be duplicated. When your needs must be fully met, consult Viking for the answer. To start, ask for Folder 52SY today.**

VIKING AN HONORED NAME IN PUMPING

See Our Catalog in SWEETS

**Viking** PUMP COMPANY Cedar Falls, Iowa

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# LESS LABOR is required to Install and Maintain Q & C One Piece Guard Rails

The sturdy arch type design with extra wide plates and bracing will resist the thrusts of the heaviest equipment.

Simplify your installations by using The Q & C One-Piece Manganese Steel Guard Rail, also speed up the work of laying rail through turnouts.

***Specify them on your requisitions.***

## THE Q AND C CO.

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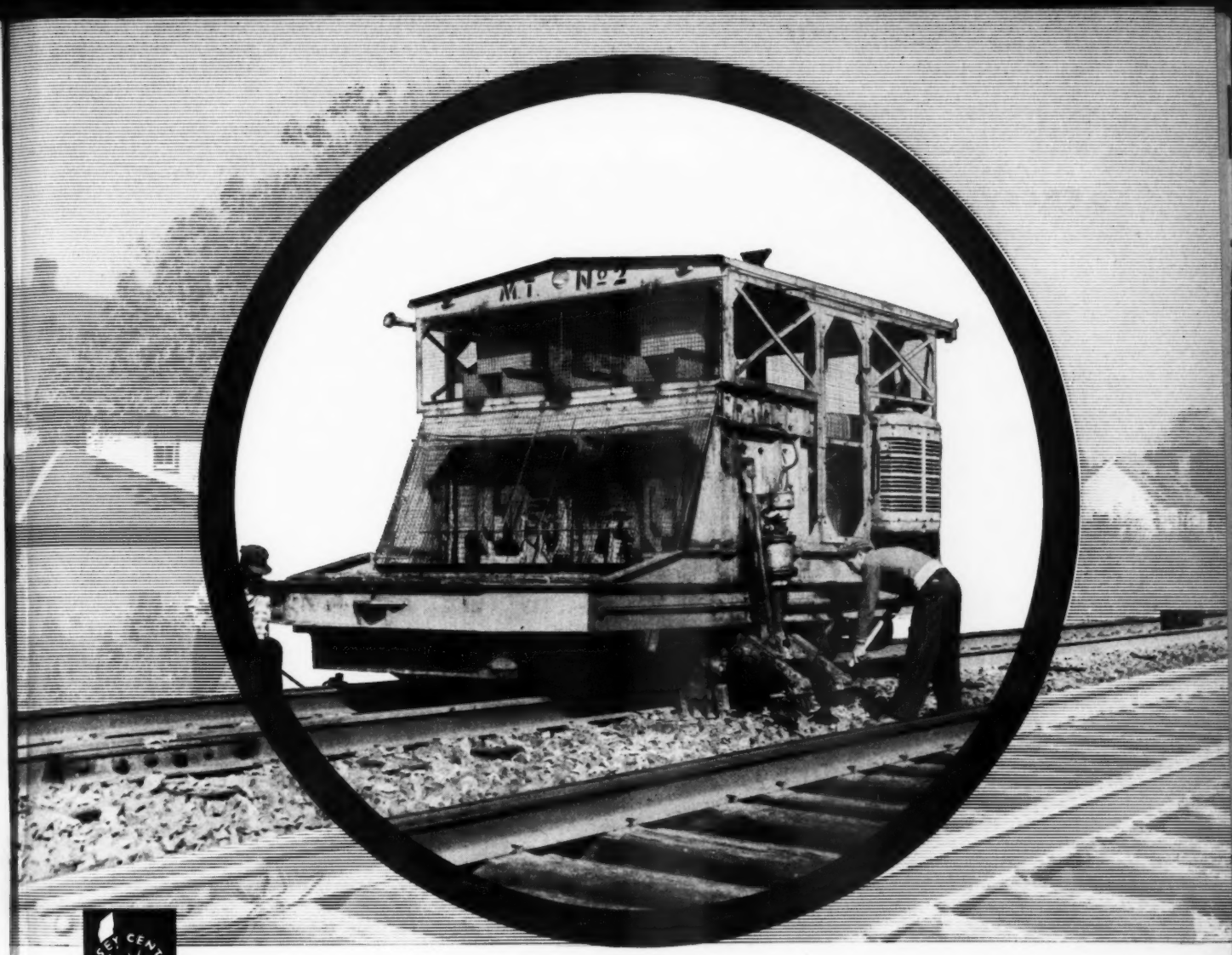



JERSEY CENTRAL LINES

*...another road that can show you why your best maintenance of way investment is a Power Ballaster.*

**Here's what YOU can expect from the POWER BALLASTER**

**Triple-Action Compaction**—Tamps down, then under, then up—for an under tie ballast foundation that fully meets AREA standards.

**Low Labor Requirement**—Easily handled with as little as two 5-man gangs.

**High Production at Low Cost**—450 to 750 feet of tamped track per hour often pays for the Power Ballaster in one season.

**Versatility**—Tamps raises from 0" to 8" on rail of any weight, with any ballast.

**Maximum Use of Track Time**—Powered jacks permit 4 men to make lateral set-off in 3 to 5 minutes... 25 MPH speed for fast runs to siding, crib or work locations.

# "Handles a surface-smoothing job or a high lift WITH EQUAL FACILITY"

In studying facts on faster, lower cost tamping with a Power Ballaster, you might well ask about the ballasts and lifts involved. Let Mr. J. W. Rementer, Track Supervisor on the Jersey Central, tell you of his first-hand experience with Power Ballaster versatility:

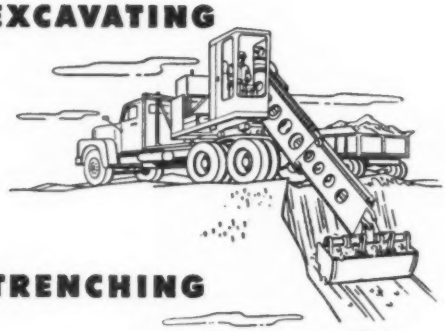
**"We use Pullman-Standard Power Ballasters because we have found them to be most efficient. Especially important is their ability to tamp all types of ballast, from cinders to large traprock, and to give full compaction while maintaining a very high production rate. We find that the Power Ballaster can handle a surface-smoothing job or a high lift with equal facility."**

You can count on faster, lower cost tamping with the Power Ballaster, not just under certain conditions, but on any rail, any ballast and any raise. Let an experienced Power Ballaster Representative give you the facts. Write us today.

TRACK AT ITS LEVEL BEST...AT THE LOWEST COST

BIRMINGHAM • CLEVELAND • PITTSBURGH • NEW YORK • SAN FRANCISCO • WASHINGTON

● **EXCAVATING**



● **TRENCHING**

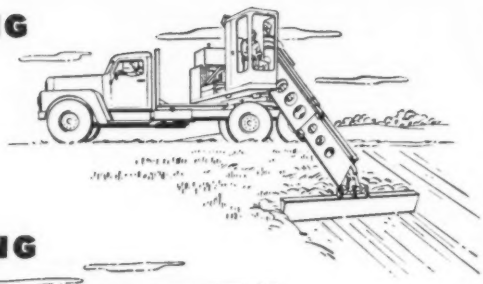
# DO IT ALL WITH GRADALL!

## Many machines in one!

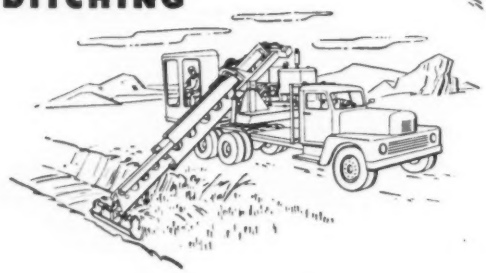
Little wonder that this versatile machine is called the *Multi-Purpose* Gradall Construction Machine! It does the work of several one-purpose machines. For instance, in pipe line work it digs the trench, lays the pipe and back-fills to complete the job.

Operated by power hydraulics, the boom can be extended or retracted, lowered or raised, tilted each way from horizontal, and rotated on a horizontal plane. The rotating platform is mounted on a pneumatic tire engine-driven chassis.

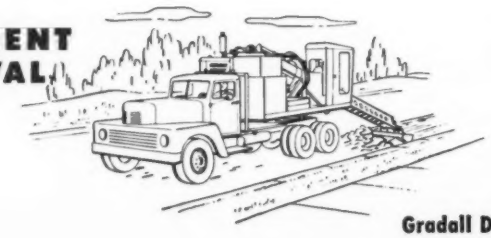
● **GRADING**



● **DITCHING**



● **PAVEMENT REMOVAL**



Tools for various applications are attached to the boom, and are quickly interchangeable . . . only a few minutes to change over.

So whatever your jobs in the construction field may be, chances are you can handle them with a Gradall! See your Gradall distributor for full details.

***SEE THE GRADALL...***
**at the National Railway Appliances Association Exhibition at the Chicago Coliseum, March 10-13. Look for the Gradall on display at Booths 23-24-25S.**

Gradall®
DIVISION OF WARNER & SWASEY Cleveland

**Gradall Distributors in over 60 principal cities in the United States and Canada**

**GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE *with Controlled Down Pressure***

# ADDITIONAL INFORMATION

*On Any of the Products Mentioned in This Issue*

**Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.**

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SERVICE DEPT.

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RAILWAY ENGINEERING AND MAINTENANCE

January, 1952

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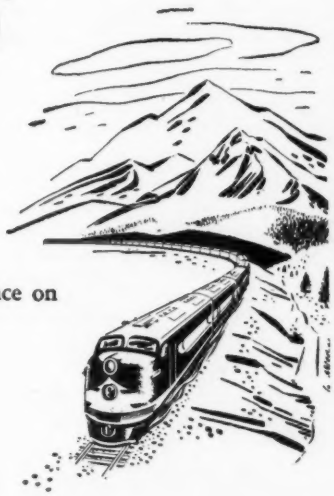
READER SERVICE DEPT.

"QUICK-WAY" digging drainage ditch.

"QUICK-WAY" used in rehandling manure.

"QUICK-WAY" dragline moves ballast.

# "QUICK-WAYS" VS. WORK TRAINS



Used to **SAVE MONEY** in handling materials, relaying rails and maintenance on all parts of the system, 3 machines in Seattle, 2 in Montana Districts, 2 in Duluth-Minneapolis, 1 in Lewiston, Idaho, 1 in Portland.

**After an initial test of one machine in 1947, a total of 9 "QUICK-WAYS" are now used for the following purposes:**

1. For rail yards in piling new and used rails, loading and unloading rails.
2. For rail relay work, handling and placing up to 125 rails per day.
3. For ditching, laying pipe, drainage and back-filling along right-of-way.
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5. For removing ballast between double tracks.
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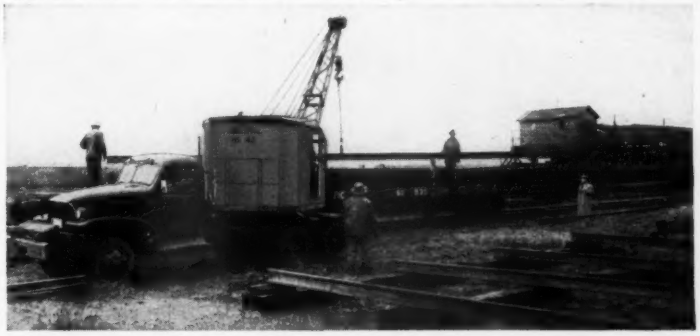

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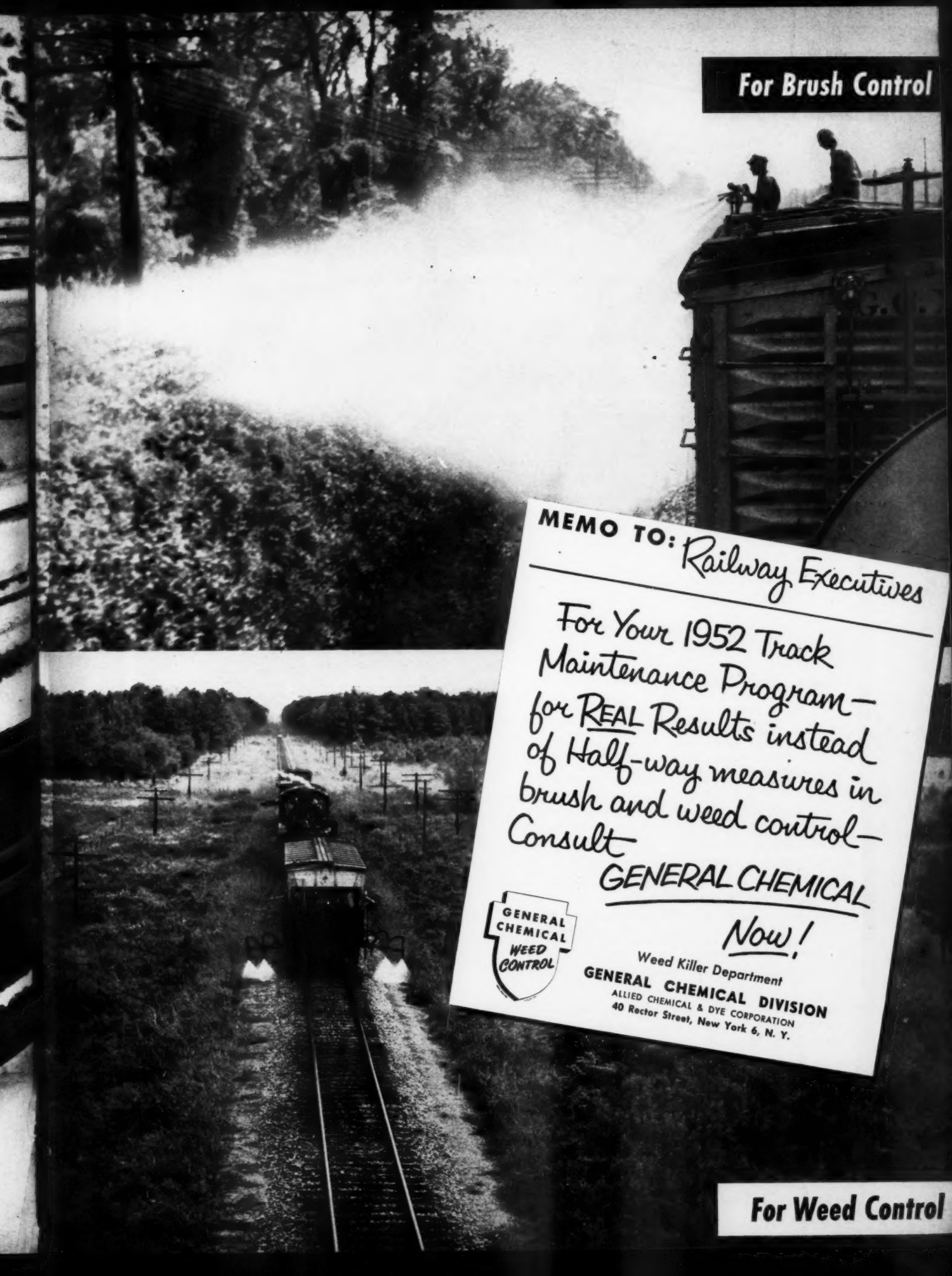
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No. 277 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
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CHICAGO 3, ILL.

**Subject:** Our "Double Life"

January 1, 1952

Dear Readers:

You may not have realized it but the editors of this magazine, in one sense anyway, lead "double lives." Before you get the wrong idea about this "confession" I will explain what I mean. Much of the time we like to regard ourselves as railroad men; at least we are closely identified with railroad maintenance of way problems and are intensely interested in the means of solving them. But at the same time—and this is the other phase of our "double life"—we are editors or journalists. When fulfilling this function our primary concern is to obtain facts, to put them into the form of words and then to put these words into the magazine, in combination with suitable illustrations, in such a way as to make them attractive in appearance and easy to read.

As railroad men we belong to and participate actively in the affairs of a considerable number of organizations and clubs composed of railroad engineering and maintenance officers. As editors we also have an organization that deals with the problems peculiar to this phase of our "double life." This is the National Conference of Business Paper Editors, which is an affiliate of the Associated Business Publications. The latter is an organization of business paper publishers. The publishers, in becoming members of the organization, dedicate themselves to adhere to two basic publishing principles. One of these is editorial independence, which means that the publisher's primary responsibility is to his readers. The second is publishing integrity, which requires that circulation claims offered by the publisher be as complete and trustworthy as possible.

But it is the National Conference of Business Paper Editors with which we are primarily concerned at the moment. By means of periodical meetings and "clinics" sponsored by this organization, the editors of member publications are given an opportunity to discuss mutual problems and to become familiar with the latest techniques for improving the quality of their work. The editors of Maintenance have endeavored to make the most effective use of our affiliation with this group and to make an effort not only to attend the meetings but to put into practice the things we learn.

For instance, a "clinic" was recently held at Chicago at which an entire day was spent discussing "fast writing." This means the kind of writing and presentation of material that will permit the reader to grasp the salient points almost at a glance. The entire staff of Maintenance attended this meeting and I feel we learned a great deal by being present, and that you will benefit by what we learned. In fact some of the points brought out have been incorporated in this very issue. Perhaps you will notice that some of the material in the feature section has been presented somewhat differently than has been our custom in the past.

Thus, you can see that our "double life" is far from being a Doctor Jekyll and Mr. Hyde proposition. In fact, our objective is to correlate the two phases in such a manner as to produce a magazine of the greatest possible value to you.

Yours sincerely,

Merwin H. Dick

MHD:ag

Editor

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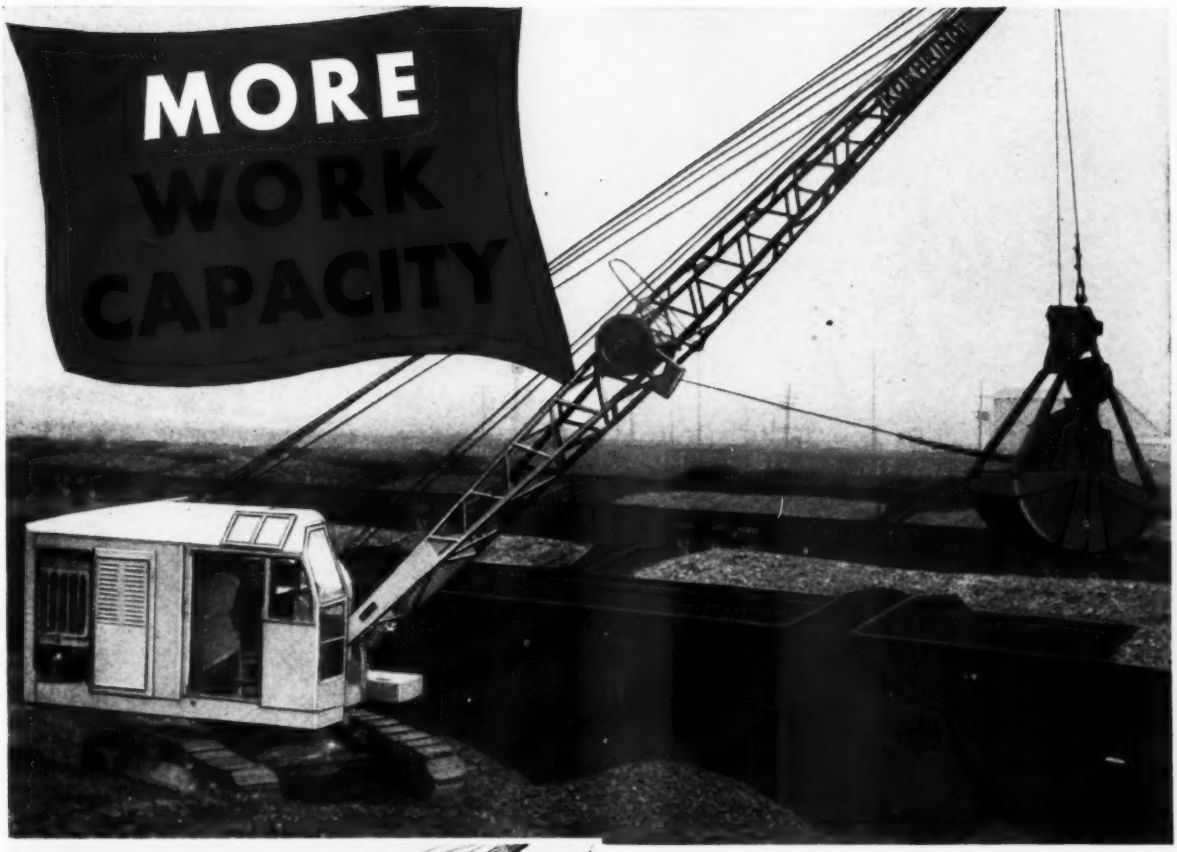


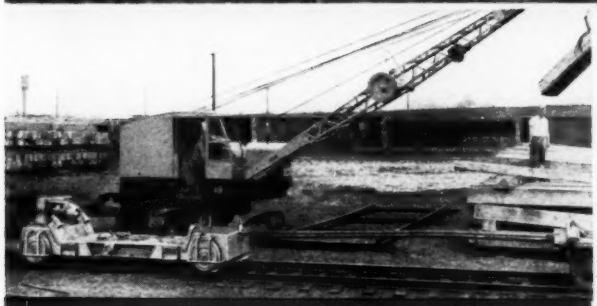

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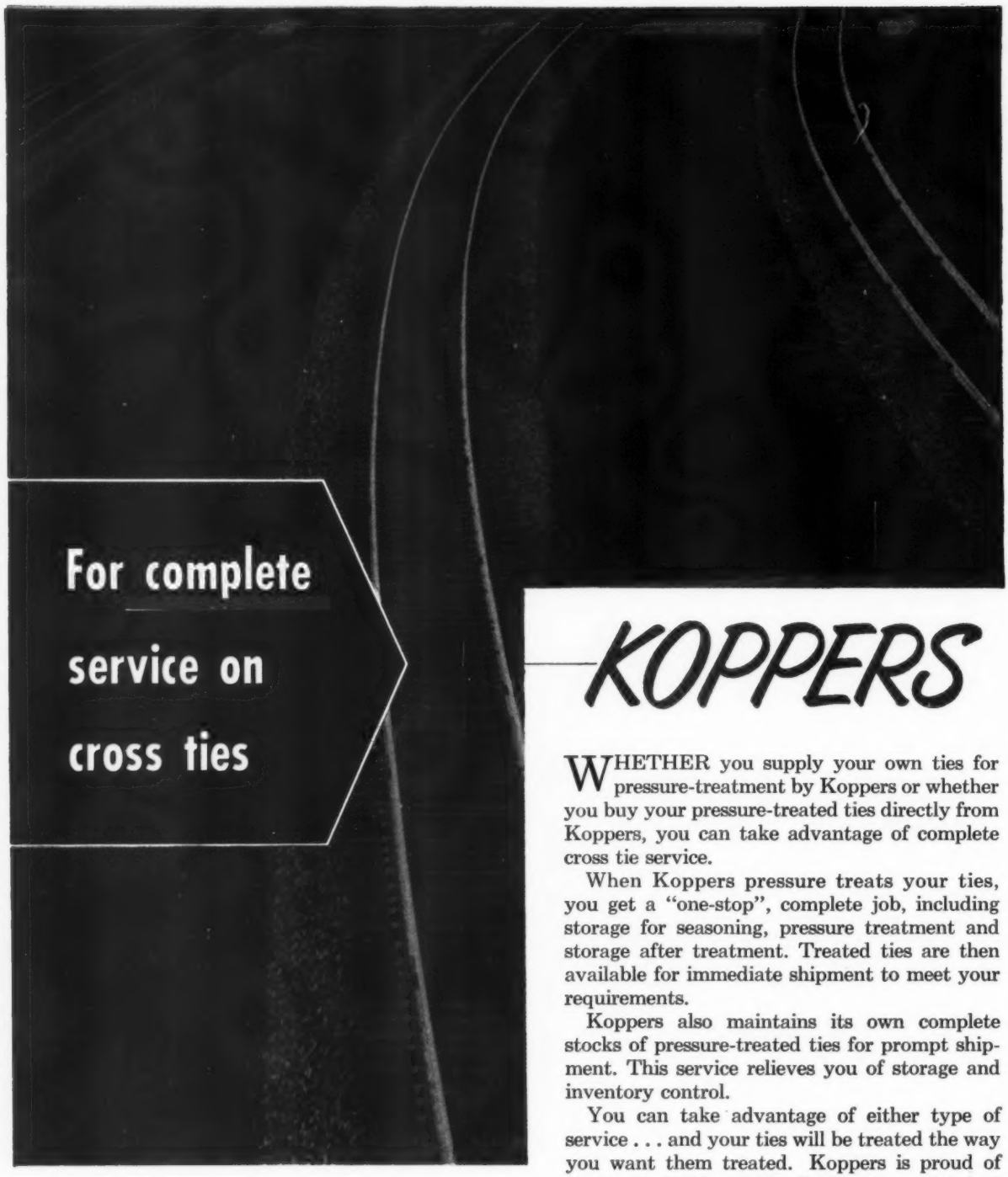

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# More Inflation—

## Will Bring Need for Greater Efficiency

From sad experience every maintenance-of-way officer now knows that inflation adds immeasurably to the weight of his responsibilities. Although the current spiral of inflation has resulted in larger appropriations for maintenance-of-way work on most roads, these increases never seem to be quite sufficient to offset the higher costs resulting from increased wage rates and prices. That is why maintenance officers have had to struggle harder than ever to get more production per man-hour and more life from materials.

These officers have plenty of reason to be proud of their accomplishments. Because of more intensive mechanization, better gang organization, revision of the basic maintenance organization, and other expedients, maintenance-of-way work is now being done with greater efficiency than ever before. Indicative of what is being done in this direction is the performance of the maintenance forces on the Frisco, as outlined in the article in this issue by E. L. Anderson, chief engineer. Charts included with this article show that a substantial reduction in maintenance man-hours has been achieved in recent years, with no corresponding reduction in the amount of work actually done.

But what about the future? A cause for alarm is contained in the fact that the forces behind the current inflationary spiral are showing no signs of abating. The major elements of these forces are government spending and the constantly recurring demands of organized labor for higher wages and other benefits that increase manufacturing costs. The organizations are even now laying the groundwork for still another round of increases, which is certain eventually to include maintenance-of-way labor.

Maintenance officers don't have to be told that any further increases in the hourly rates of the forces under their supervision will largely have to be "absorbed" in one way or another. It is reasonable to assume that, on most roads anyway, the possibilities for increased efficiency through the means now being used have not been exhausted. But some maintenance men are beginning to wonder, and with some justification, whether mere intensification of present policies will be sufficient to cope with the situation. They are beginning to wonder if it won't be found necessary, some time in the future, to undertake a more complete revision of track standards and maintenance policies than is generally visualized today.

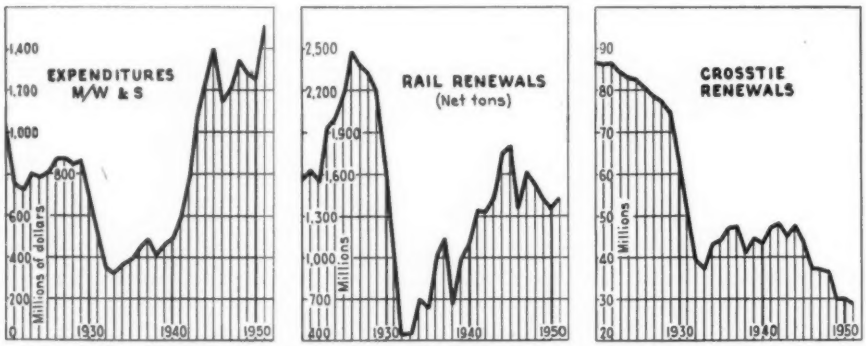
The advent of the diesel-electric locomotive brought about a revolution of those phases of railroading involving the utilization of motive power and the movement of trains. Substantial economies have been realized as a result of the extensive use of diesel power, economies that are reported in some instances to be sufficient to mean the difference between solvency and insolvency.

In the maintenance-of-way department there has been no development comparable in its effect on maintenance costs to that of the use of diesel-electric power on transportation costs. As a new year dawns it is interesting to speculate on the possibilities that such a development might occur. Meanwhile, the increasing pressure of inflation will require that maintenance men redouble their efforts, using the means presently at hand, to increase the efficiency of the forces working under them.

## 1951 IN REVIEW—

### *And an Appraisal of the New Year*

DOLLARWISE, maintenance of way and structures activities on the railroads of the United States in 1951 reached the highest level on record. Based on the actual expenditures for the first nine months, as reported by the Interstate Commerce Commission, it is estimated that the total maintenance-of-way expenditures of the Class I roads for 1951 amounted approximately to $1,508 million, an increase of $220 million, or 17.1 per cent, as compared with 1950. The previous high was reached in 1948 when the expenditures for this purpose came to $1,348 million.




**Charts show 31-yr. record of M/W activities for Class I roads (1951 figures estimated)**

It is not easy to determine how much of the increased expenditures was caused by inflated wage rates and prices of materials on the one hand or, on the other, by an actually greater volume of productive work. Two of the major indices—rail and tie renewals—indicate that there was little change in these categories of activity, the first being up and the second down. Based on information furnished to this magazine by most of the Class I roads it is estimated that these lines as a whole laid 1,383,000 net tons of new rail in 1951. This represented an increase of 30,200 net tons, or 2.2 per cent, as compared with 1950.

Tie renewals present a somewhat different picture. Based on similar information obtained from nearly all the Class I carriers it is estimated that these roads as a whole inserted 28,835,000 crossties in renewals in 1951. This figure is significant for several reasons. In the first place it represents a decline from 1950, whereas at least a moderate increase had been expected. The decrease amounted approximately to 1,659,000 ties, or 5.5 per cent. Secondly, it means that tie renewals reached an all-time new low for the fourth consecutive year. Obviously, the lengthening span of tie life due to the methods of preservation being used ever more widely is a factor in keeping tie renewals at a consistently low level. However, in view of the further slump in 1951, it is not improbable that for one reason or another—inadequate supplies, labor shortages, etc.—at least some roads were not able to complete projected tie-renewal programs in that year.

But now that 1951 is history, what about the outlook for 1952? With government spending continuing at a high level, and the possibility that it will go even higher, it is generally assumed that the railroads will continue to carry a relatively high volume of traffic throughout the year. A corollary assumption is that maintenance activity will react with corresponding vigor in the year that lies ahead.

However, in recognition of the fact that predictions are never safe without supporting facts, a large number of roads were asked to supply estimates of the volume of rail and tie renewals they plan to make in 1952. On the basis of the figures received it is apparent that the railroads as a whole are planning substantially higher programs of track maintenance work in that year. It is estimated, for example, that the Class I roads are planning to lay 1,611,700 net tons of new rail. This will mean an increase of 228,500 tons, or 16.5 per cent, compared with rail renewals in 1951. On the same basis it is estimated that the roads are planning to insert 31,943,000 crossties this year, which will be 3,108,000 ties, or 10.8 per cent, more than last year.

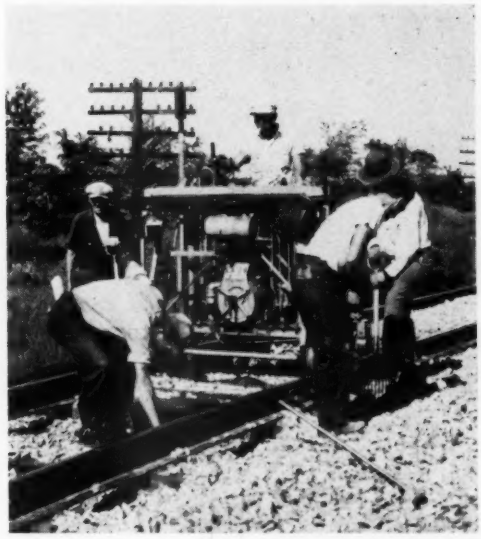
Whether circumstances will permit these enlarged programs to be carried out in their entirety is a moot question. It might be assumed, for example, that the steel shortage might interfere with the rail-laying programs, or that shortages of manpower, created by the high level of industrial activity generally, might cause the railroads to experience difficulty in getting sufficient men for their needs. Although acknowledging the fact that such obstacles may be encountered a number of maintenance men with whom this matter has been discussed are confident of their ability to overcome them. The extent to which this confidence is general will be the most important factor in determining how much work will be done in 1952.

## ANNUAL INDEX—

### *How to Obtain Your Copy*

THE INDEX of all material published in *Railway Engineering and Maintenance* during 1951 will soon be ready. Those who have requested copies of the annual index in previous years will automatically have one mailed to them this year. If you have not requested a copy of the index in any prior year, but desire to have a copy of the 1951 index, all you need to do is fill out and mail the coupon included on page 43 of this issue.

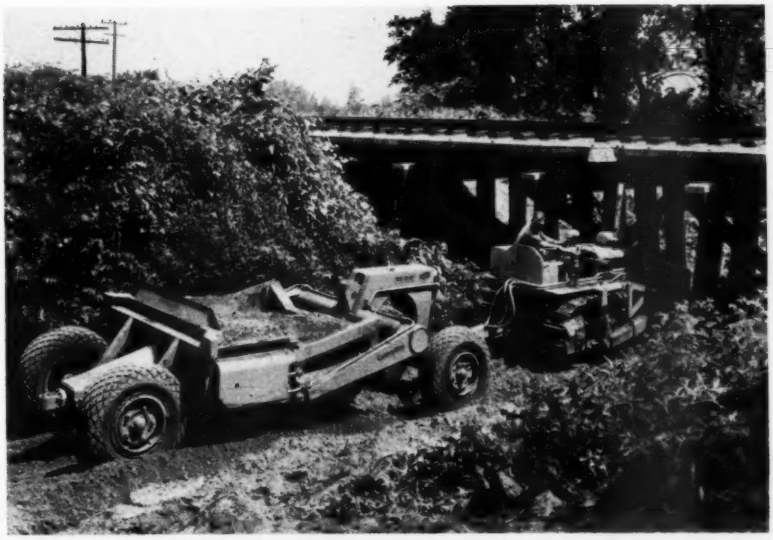
After a 2-year slump, motor-car purchases returned to first-place ranking



Power jacks were again bought in substantial numbers

# Record Amount Spent For Roadway Machines in 1951

**Railways reported that they purchased 9,700 units of work equipment and power tools for which they paid an estimated $19,500,000. Present plans of many roads call for even heavier buying this year**



Purchases of grading equipment, particularly crawler tractors, were much higher

• In 1951 the need for equipment was great, the purchasing power of the railroads was high, and, in spite of material-supply hardships, the manufacturers were able to deliver "the goods." Such a combination of wholesome factors could not help but produce the highest dollar volume of work equipment purchases in history—exceeding the previous record, established in 1947, by $400,000. Although the number of units purchased by the railroads of the United States and Canada in 1951 did not establish a new "high," as did the dollar volume of buying, it was the fourth highest of record, being exceeded only during 1944, 1945 and 1946.

The figure showing the number of units of work equipment purchased in 1951 is an estimate based on answers to a questionnaire sent to all railways of the United States and Canada. Replies were received from about 80 per cent of the roads of these two countries, including all but a few of the important lines. Of the roads submitting replies in 1951, 176 reported purchasing a total of 9,622 units. This compares with 7,901 units purchased by 159

Scrapers were another class of grading machines that were bought in larger numbers

roads in 1950. Of the Class I roads reporting in 1951, 50 acquired more equipment than in 1950, and 31 reported fewer purchases. A great many of the other reporting roads bought about the same amount of equipment as in previous years.

### This Year to Be About Same

Conflicting "signs of the times" make it hazardous to predict the volume of equipment that will be purchased in 1952. Although the railroads are presently carrying a relatively high volume of traffic, net railway operating income is lower than in recent years, primarily because of the high cost of labor, materials and taxes. In one sense, on the other hand, this situation may give greater impetus to the normal demand for work-saving machinery to effect the greatest possible economy in carrying out the large maintenance programs needed to assure efficient handling of the continuing high volume of traffic that is anticipated.

Taking cognizance of the inherent ability of machines to reduce the cost of performing large amounts of work, many railroads have already programmed a big volume of work-equipment purchases for 1952. Seventy-nine of these railroads have provided this magazine with dollar estimates of the amount of work equipment they plan to buy. Of these roads, 46 expect to spend more money for this purpose than in 1951, while 30 reported that they would spend less. Specifically, the planned purchases of these 79 roads as a group will amount to $7,397,307, an increase of $123,870, as compared with the amount they spent in 1951. These factors, weighed carefully, indicate that the amount of work equipment to be purchased this year will probably at least equal that bought in 1951.

More equipment was bought in 1951 for transporting men and materials than for any other purpose. The purchase of motor cars snapped out of a slump of two years' duration, with the number of cars bought bouncing to a total of 2,012, thereby returning this category of equipment to the first place ranking it had held for many years. This figure compares with 1,229 cars purchased in 1950, and 1,462 units reported as bought in 1949. Paradoxically the purchases of push cars and trailers did not increase along with motor cars. On the contrary, the number of such units declined from the 602 purchased in 1950 to 553 last year, but the number of hand cars acquired increased from 51 to 83.

### Highway Vehicles Also Up

The trend that has been in evidence for several years toward the use of highway trucks and related equipment for moving men and materials continued in 1951 with a further increase in the amount of such equipment purchased. Specifically, these purchases included 283 automobiles, 1,113 trucks, and 30 trailers, a total of 1,426 units. In 1950 the reporting railroads acquired 198 automobiles, 889 trucks, and 68 trailers, for a total of 1,157 units.

With more rail to be laid in 1951, railroads purchased more equipment to install it

Although the reporting railroads acquired more machines for carrying out ballasting programs in 1951 than in the year before, this category of equipment lost the first place ranking it held last year to the perennial leaders, motor cars and highway vehicles. To be specific, the reporting roads purchased 1,365 machines in this category in 1951, compared to 1,325 such machines bought in 1950. Although the overall increase in this category was small, it is interesting to note that major increases occurred in several individual types of tamping equipment. For instance, the purchase of pneumatic tamping outfits jumped from 218 in 1950 to 389 in 1951, while unit tampers increased from 23 to 94 and electric tampers, excluding the multiple type, increased from 244 to 261. Other reported purchases of ballasting and surfacing equipment in 1951 included 58 large on-track tampers, 494 tamping tools, 44 power jacks, and 26 ballast diskers.

### More Rail-Laying Equipment

Commensurate with the slightly increased amount of new rail laid in 1951, the reporting railroads purchased more equipment to install it. The total units acquired in this category came to 1,010 machines, compared with 713 purchased in the previous year. As was the case in 1950, most of the different types of equipment in this category shared in the general increase. The specific types that were bought in greater quantity included adzing machines, bolting machines, cribbing machines, rail drills, spike pullers, power rail layers and rail saws. Declines occurred in only two types, rail cranes and spike drivers.

Grading equipment ranked next according to the total volume purchased by the recording railroads. This was another category of machines of which increased purchases were reported. In fact, the number of units bought—653—was more than double the 300 units purchased in 1950, and almost three times the 259 units obtained in 1949. Several classes of equipment in this category deserve special mention for the very large increase in their purchases. These include crawler tractors, of which 255 were bought in 1951 as compared with only 54 in 1950; bulldozers, including tractors, of which 124 were purchased in 1951, as compared with 81 in 1950; and earth-moving scrapers, of which 64 were obtained last year while only 22 were purchased the year before. The increased activity in the purchase of machines in this category was so general that not a single class of machines was bought in smaller quantities than the year before, and only two types—motor graders and spreader-ditchers—were bought last year in the same quantity as in 1950.

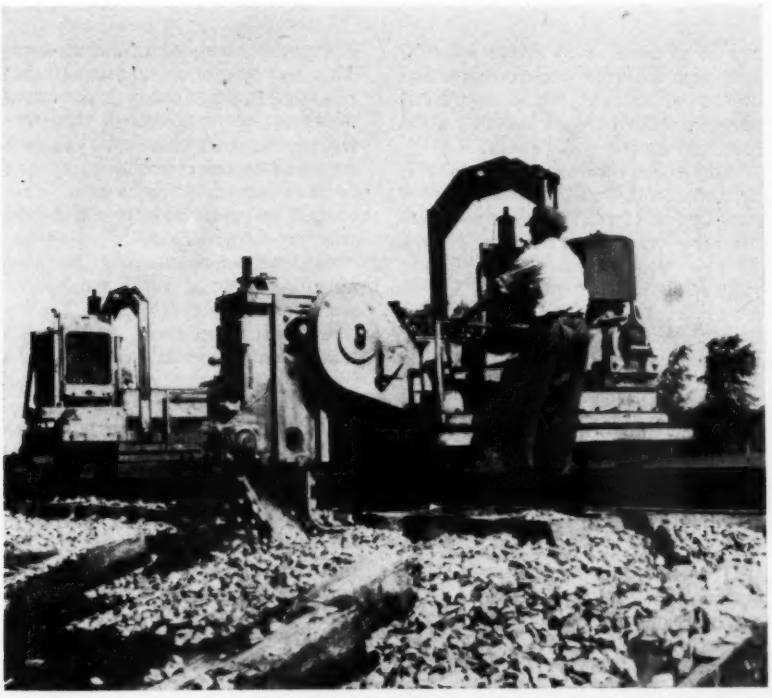
As was reported a year ago, a small increase occurred in the reported purchases of cranes—from 81 in 1950 to 87 in 1951. Of these, more crawler cranes and highway units were purchased than in the previous year, while fewer rail-handling and locomotive cranes were bought. The total figure on crane buying does not include draglines and shovels which are incorporated in the purchases of grading equipment mentioned above. The purchase of derrick cars was also taken out of the total purchases of cranes as not being typical of the group as a whole. The purchase of such cars continued to drop, reaching a new low of 29 in 1951 as compared with 45 in 1950 and 52 in 1949.

### Power Plants More in Demand

All tie tamping outfits purchased in 1951 include the power plants necessary for their operation. However, in addition, the railroads reported the purchase last year of 248 power-plant units to replace worn-out units and to supply power for the operation of a variety of power tools used in bridge and building work. These units included 129 air compressors and 119 generators. This compares with the purchase in 1950 of 226 power plants, which in turn included 91 air compressors and 135 generators. Considerably fewer motor car engines were purchased in 1951 than in prior years, dropping from 135 in 1950 to 42 in 1951.

### Miscellaneous Equipment

It is significant that a substantial increase occurred in the reported purchases of welding outfits—from 48 in 1950 to 78 units in 1951. Other classifications of equipment reported as purchased in 1951 include concrete mixers, grading outfits, hoists, mowing machines, paint-spraying outfits, paving breakers, portable pumps, rollers or impactors, tie cutters, tie borers, weed burners, yard-cleaning machines, pile drivers, snow plows, chain and other timber saws, etc. Finally the reported purchases of miscellaneous machines came to a total of 242 units, compared with a total of 541 units in 1950 and 288 in 1949.



**Purchases of machines for carrying out ballasting programs increased last year**

The Frisco's District Gang 557, which consists of a foreman and 14 men, is shown surfacing track near Baxter Springs, Kan.

# M/W Trends— Evolution of a New

**Underlying changes in conditions affecting maintenance organizations over a long period of time, and what the Frisco has done about them, are discussed in this article, which is adapted from a paper presented before a recent meeting of the Maintenance of Way Club of Chicago.**

By E. L. ANDERSON
Chief Engineer
St. Louis-San Francisco
Springfield, Mo.

• One of my earliest recollections as a boy on a farm, cut by the Burlington and bounded on one side by the Wabash, in the western part of Illinois, is of the track forces, ordinarily termed "the section gang," going up and down the railroad on handcars, performing all of their work with small tools. Upon entering railway service a number of years later, or just shortly prior to World War I, the same practices were in effect.

It seems appropriate at this point to call attention to the fact that the wages per hour of section laborers at that time were about one-fifteenth of what they are at present, while wages of the foremen were about one-fifth of what they are at present. This wage relation between laborers and foremen becomes significant at the present time in securing and holding good foremen on the job.

About the time of World War I, or shortly thereafter, track motor cars began to replace the handcars used by track-maintenance forces. This development caused some rather significant changes to be made in the operation of these forces. With the track motor car they were able to go a considerable distance away from headquarters in a short period of time and, upon reaching the job, were not physically tired and could start digging right into the work that was to be done. In addition, a larger number of men could be carried on one unit, permitting larger gangs to be used under one foreman and, consequently, longer sections than were logical in the handcar days.

During the period between World War I and World War II, great development occurred in the use of maintenance-of-way work equipment, replacing hand tools. This development was rather far-reaching in its effect on track-maintenance organizations in that men with greater mechanical skill were required to operate the equipment than were required with hand tools. The production per man-hour was greater. Heavier materials could be more readily handled, and work could be done with a smaller amount of physical effort than with hand tools. In addition, jobs became available that paid a higher rate in many instances than the ordinary laborers' rate.

During the depression years, immediately prior to World War II, a good many roads, in endeavoring to make the dollar stretch as far as possible, eliminated the patrolling of track by section gangs. The method followed usually provided for patrolling by a special unit, a track supervisor, or an assistant roadmaster, with the thought that the section gangs could devote their entire time to constructive work. This system is still in vogue

In connection with the surfacing work near Baxter Springs, crossties were renewed

# Set-Up on the Frisco

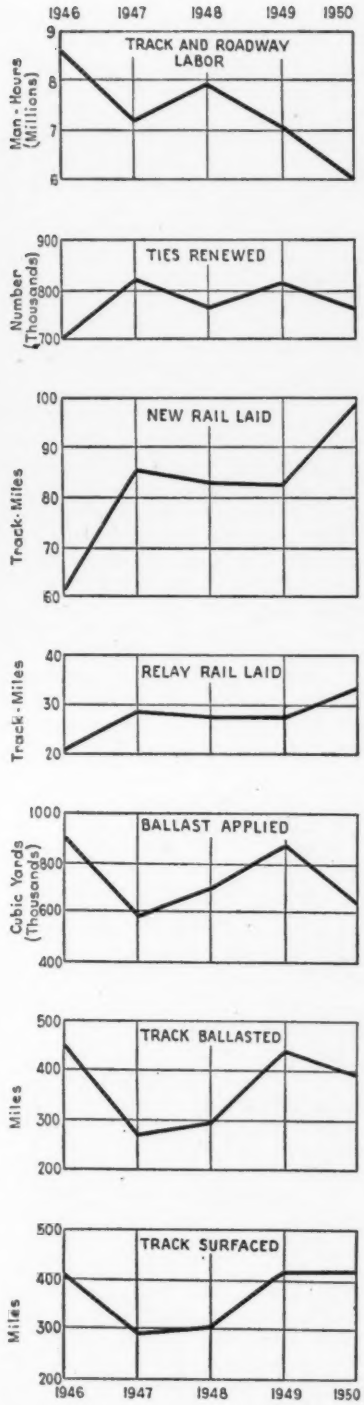
on some lines, and is advocated by them as an excellent arrangement, while others have given it up.

By the beginning of World War II, there had been a large number of power machines and tools developed for use by track-maintenance forces. Since full utilization of such equipment could only be secured by gangs larger than ordinary section gangs, some reorganization of gangs began to take place, resulting in larger gangs doing more out-of-face work than in the period prior to the inauguration of maintenance-of-way work equipment. Since the beginning of World War II, this equipment has been improved, and additional machines have been developed until, as of the present, there is a machine for almost every phase of track-maintenance work.

By the beginning of World War II a shortage of available forces existed at many locations so that many roads began transporting gangs in trucks from concentration points where labor was available to points where it was not readily available, still leaving the section gang as a patrolling or "rabbit work" unit, the transported gangs working largely as rebuilding gangs. This handling proved, in many instances, rather satisfactory. In fact, on the Frisco it worked out so well that we began giving thought to establishment of gangs handled by truck for our ordinary track-maintenance work, with the result that we started establishing gangs called district gangs—the name being used principally to distinguish them from section and extra gangs. Briefly, the district gangs fall under two general classifications:

1. Used as a supplementary force to section gangs without a patrol unit or responsibility for any particular section of track.
2. With a patrol unit included in the gang and responsibility assigned for a definite section of track, without any section gangs.

These district gangs should be differentiated from extra gangs in that a district gang has a definite as-




These charts comprise a revealing graphic illustration of the trend of maintenance-of-way activity on the Frisco from 1946 to 1950, inclusive. The most significant fact brought out is the reduction in the number of man-hours devoted to track and roadway work. In 1950 the road renewed almost as many ties as in 1947, laid more rail, and ballasted and surfaced 45 per cent more track, and did it with 17 per cent fewer man-hours. The answer is increased mechanization and a more efficient maintenance set-up

signed headquarters, is transported by truck or motor car, and not assigned outfit cars, has interchangeable rights with section forces on the roadmaster's territory to which it is assigned, and can be used on the same type work as section force. Extra gangs ordinarily hold rights on an operating division, are not assigned to any definite headquarters, and handle only heavy or out-of-face work.

The first district gang was established on the Frisco at Olathe, Kan., on October 16, 1947, to supplement the work of section forces on two main tracks, between Rosedale and Paola. Prior to establishment of the district gang there were nine section gangs in this territory and, at the time of establishment of the district gang, four section gangs were eliminated and the territories of the remaining gangs were extended. The district gang, under the supervision of one foreman, continued to work the same number of laborers that were cut off of the sections, but handled the heavier and out-of-face jobs, while the section gangs continued to do the lighter and minor jobs.

**Men of District Gang 383 boarding a truck which transports them to the job site**

## New Set-Up Extended

The work accomplished by this gang and the general set-up was so successful that in about a year's time we began establishing additional district gangs, and by the time the 40-hr. week went into effect in September 1, 1949, we had a total of 68 district gangs, all falling under classification No. 1 outlined above. Thought was then given to the possibility of eliminating all section gangs on a roadmaster's territory and establishing district gangs under classification No. 2, and such an arrangement was put into effect on July 1, 1950, on the 50th track division, Creek subdivision, Sapulpa, Okla., to Francis, and Okmulgee, Okla., to Muskogee. Since that date, additional roadmasters' territories have had their track forces reorganized under classification No. 2, with the result that this organization has been established on 13 roadmasters' territories out of a total of 36, except that one section gang was left on each of 4 such territories to handle either a branch line or a terminal. The patrol unit under the district-gang set-up is ordinarily furnished with an inspection type motor car, or a very light section gang motor car, and the gang proper is ordinarily transported in a truck.

At present, we have a total of 185 sections and 90 district gangs. Of the district gangs, 42 have patrol units under classification No. 2, and each such gang has an assistant foreman in addition to the regular foreman.

The district-gang type of organization, as used on the Frisco, was inspected by A.R.E.A. Committee No. 22 (Economics of Railway Labor) on July 11, 1951.* Sub-Committee No. 2 of that committee will present a report on this type of organization at the March, 1952, convention of the A.R.E.A.

We have found that the use of small extra gangs is gradually decreasing under the district gang set-up as the district gangs are able to accomplish more and more out-of-face work of the type that at one time, on many territories, was largely carried on by small extra gangs. We know that the success of this type organization has not been made possible entirely by the reorganization of the track-maintenance forces, but some of it is due to greater mechanization, the efficiency of which, in turn, is made possible largely by use of gangs of adequate size.

Although there are some disadvantages to such an organization, we have found they are far outweighed by the advantages. I will mention two of the principal advantages. The first is greater production per man per hour paid for. The second is the fluidity of the gangs in emergencies such as derailments, washouts, slides, etc.

There are many factors that must be given consideration before attempting to establish a system similar to the one described above. Almost every track district under consideration will present some problems different from the previous one. Each factor must be weighed and evaluated carefully to determine what economy and increased efficiency can be secured by the change.

Physical factors to be given consideration are as follows:

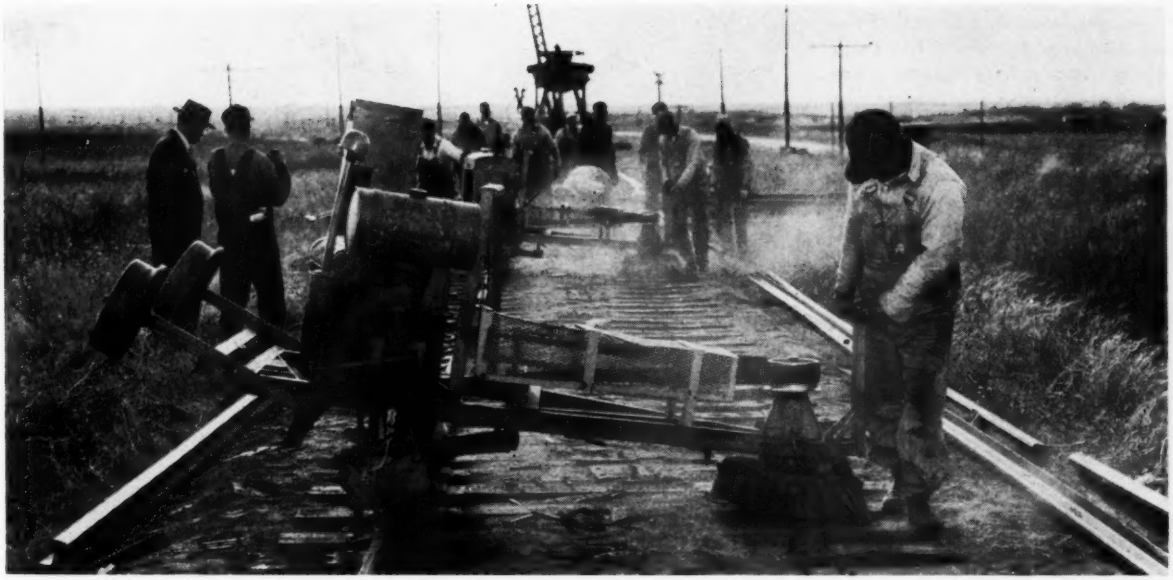
(1) The actual physical condition of the track where such a track-maintenance organization is to be established. This is particularly important if all section gangs are to be eliminated. Without question, such an organization can best be first established where the track structure is in good condition, and where a planned organization can be set up to work largely out-of-face, accomplishing each year out-of-face work on a definite mileage of track with a minimum amount of patrolling and spot "rabbit" work being required.

(2) The possibilities of establishing the headquarters at a centralized point, with highways so located that the portion of track to be maintained by the gang is readily accessible from the available highways.

(3) The stability of the roadbed, which should be such that the track will lend itself to a planned system of out-of-face work without the necessity of a great deal of emergency work being done to support the track structure. This is perhaps the most important consideration.

Organizational considerations are as follows:

* This inspection trip was described in detail in the September 1951 issue of *Railway Engineering and Maintenance*, page 810.



**Here District Gang 383 is shown removing 67-lb. rail in preparation for laying cropped 110-lb. relay rail near El Dorado, Okla.**

(1) Can a suitable agreement be reached with the organization that represents the maintenance-of-way-forces?

(2) Can foremen be obtained who are capable of handling a mechanized gang of fair size?

(3) Can the track supervisor, or roadmaster on the district, be depended upon to push the organization and line up gangs to handle the work properly?

## The Foreman Problem

We are constantly faced with the problem of securing good foremen, or obtaining men who will assume the responsibility of foremen for the difference in rate of pay between foreman and laborer. Earlier in this article it was stated that foremen today are receiving about five times what they did many years ago, while laborers are receiving about fifteen times more. This situation exists because wages have been increased largely on a cents-per-hour basis instead of a percentage basis.

All industry today is striving for improved methods of operation, and for efficiency in production. Constant study is being made to accomplish those results. Maintenance-of-way supervisors and officers do no less than endeavor to keep the railroad industry abreast, or ahead, of other types of industry. As pointed out previously, very little improvement or change was made for many years in track-maintenance organizations, and such changes as have been made were largely due to outside influences, such as:

**The men who have been working ahead pulling spikes, etc., double back to lay the rail**

(1) Greater speed, requiring a higher type of track maintenance.

(2) Better maintained schedules, necessitating that restrictions be kept to minimum.

(3) Heavier wheel loads, requiring heavier and better materials in both roadbed and track structures.

The old type section gang with a foreman and a few laborers, insufficient in number to take advantage of mechanical equipment and to handle heavy materials, is, in general, on the way out. The system of patch work followed by such gangs for a number of years, after which an extra gang took over as a rebuilding job, does not fit into the present picture.

It is evident that future track-maintenance organizations will call for:

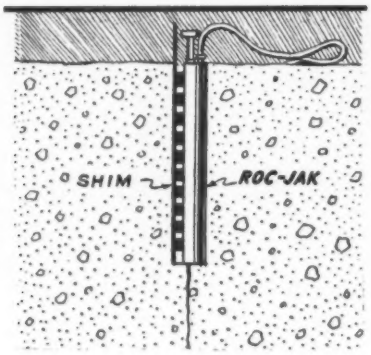
(1) Stability of employment.

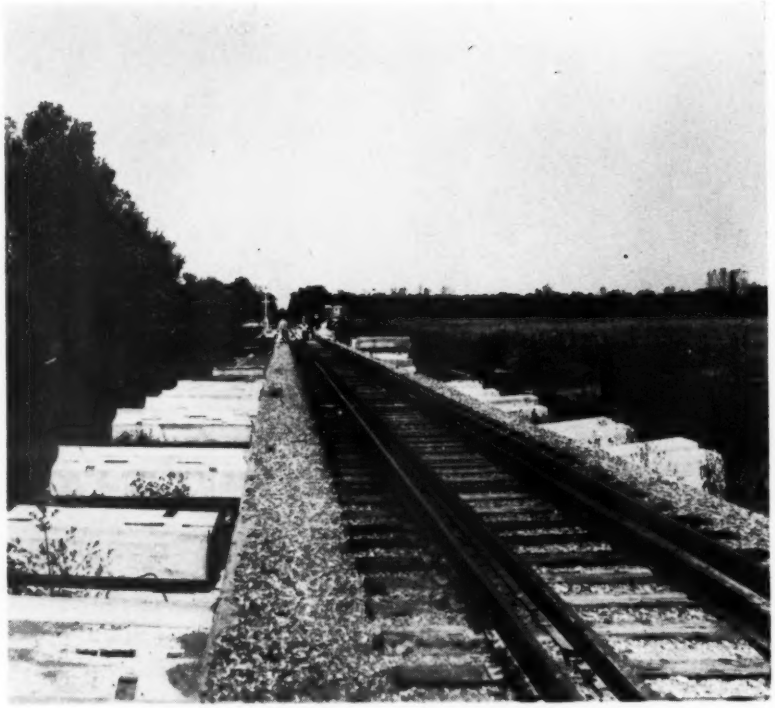
(2) The employment of a better class of men.

(3) Special training for prospective foremen, and more care in the selection of foremen.

(4) The programming and carrying on of track work largely as a rebuilding and out-of-face proposition, to eliminate patching and spot repairing, by gangs organized and equipped to function economically, and to be transported in mobile off-track units.

**In the recent renewal of the deck slabs and caps of the reinforced concrete trestle approaches to a steel bridge the Burlington made good use of a device that made it possible to split the old one-piece slabs into two parts easily and without the use of explosives. The nature of the device and the procedure for using it are described herein.**



North approach of the Salt River bridge, showing the new precast slabs on the left and the caps on the right, ready for installation. Old deck slabs were in one piece

*Concrete Splitting Made Easy...*

# Breaks Deck Slabs With Hydraulic Device

• A device that permits a concrete deck slab to be split down the middle with relative ease and without the use of explosives greatly simplified the renewal recently of the deck slabs of the reinforced concrete pile-trestle approaches to a steel bridge on the Chicago, Burlington & Quincy. The device that proved so useful on the job is known as the Roc-Jak and is described in detail at the left. With the aid of this unit, each of the old one-piece slabs was divided into two parts along the longitudinal center line so that each of the pieces could be lifted out easily by a derrick. Otherwise it would have been necessary to use dynamite (with the attendant hazards and unpredictable results) to blast the slab into pieces.

This project involved the renewal of the single-track reinforced concrete trestle approaches to the Burlington's three-span truss bridge across the Salt River near Reading, Mo., on the line from St. Louis, Mo., to Burlington, Iowa. This structure, including the approaches, was built in 1907. The north approach has a total length 434 ft. 9 in. from the back wall to the center of the end pier of the first steel span, but the south approach, having only three spans, is 39 ft. long.

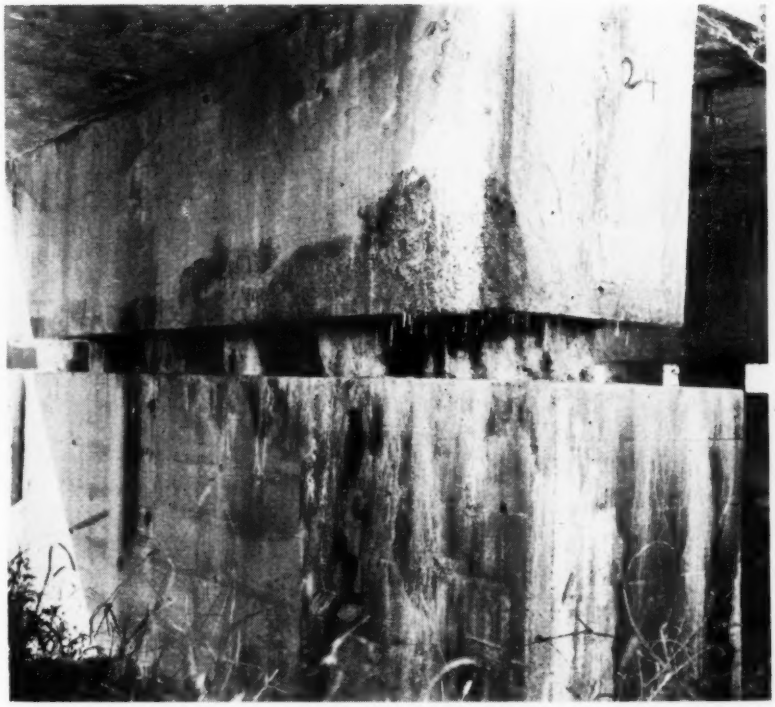
In the original construction the bents each consisted of six 26-ft. cylindrical reinforced concrete piles, all driven vertically, topped with a poured-in-place concrete cap. The slabs were also poured in place and each one of them was

## What the Roc-Jak Is; How It Works

The principal parts of this device consist of a "breaker body," a hand-operated hydraulic pump and a piece of high-pressure hose 6 ft. long. The breaker body, made of heat-treated steel, is 24 in. long and 3 in. in diameter. It has a T-shaped handle at one end and a connection at the same end for the hose leading to the hydraulic pump. Spaced evenly in a line along one side of the body are 10 machined piston openings, and in each of these there is a 1⅝-in. piston of hardened alloy steel. Behind each piston is an easily removable neoprene cup which is said to be capable of withstanding a pressure of 15,000 p.s.i. Each piston is claimed to exert a pressure of 15 tons; thus the total pressure developed is 150 tons.

To use the Roc-Jak the first step is to drill one or more 3½-in. holes 2 ft. deep in the piece of masonry to be broken. A Roc-Jak, with the pistons retracted, is inserted in the hole along with a steel equalizing shim or feather. Pressure is then applied by operating the handle of the hydraulic pump. After the "slack" in the hole has been taken up it is said that an additional piston travel of ⅛ in. is sufficient to cause a "break" at right angles to the line of thrust. When breaking larger pieces the use of two Roc-Jaks in unison is recommended. When a break has been made the Roc-Jak is removed and the pistons retracted by opening a release valve on the pump and a "spill" valve on the jack.

The Roc-Jak is manufactured by K. O. Duncan, 1350 Wright Street, Los Angeles 15, Calif.



Close-up of one of the bents after the new encasement had been placed around lower portions of the piles. To renew caps the piles were cut off flush with encasement

Man in center is drilling 2-in. holes in an old slab to establish the break line

built in one piece. The panels average about 14 ft. in length. Five permanent piers of solid concrete supported on timber piles were provided in the north approach. The first of these was six panels from the north end of the approach, while all the others were spaced five panels apart.

In recent years serious deterioration had become evident in the approach trestles, especially in the pile caps and the slabs, with the piles remaining relatively sound. Several years ago the permanent piers were restored by encasing them in concrete, but nothing was done at that time regarding the slabs and pile bents. In 1950 a renewal program was decided upon which contemplated the application of a concrete encasement around the lower portion of the bents and the replacement of the bent caps and the slabs with precast units. The concrete work was started during the summer of 1950 with the application of the bent encasement which extended from the ground line to a height of about 4 ft., leaving a gap of about 8 in. between the top of the encasement and the bottom of each old cap. At the same time the new caps were precast on the site. The new deck slabs, which conform to the railroad's standards for this type of construction, were cast at the Burlington's system concrete yard at Havelock, Neb.

### Much Equipment Used

The actual work of renewing the approach trestles was started in the late summer of 1951, and was completed about January 1, 1952, with the panels of the south approach being renewed first. The job was carried out by a division bridge and building gang consisting of 10 men and a foreman. Mechanical equipment used by the gang on this job consisted of a 160-cu. ft. Worthington compressor, two Duff-Norton 50-ton air jacks, two Roc-Jaks, two concrete mixers, a Fairmont derrick car, an oxyacetylene welding and cutting outfit, and a wide assortment of Chicago Pneumatic air tools, including two air spades, three chipping hammers, two 2-in. drills, a 3-in. drill and two demolition hammers.

The general procedure consisted of splitting all the deck slabs between any two of the permanent piers and then renewing the slabs and caps between these piers before going ahead to the next group. Preparatory work before splitting a slab included the removal of the ballast for the length of the slab, using the air spades to loosen it, and the blocking up of the ties with an 8-in. by 16-in. stringer under each rail, thus permitting traffic to move over the slab while the work proceeded. Another preliminary step was the cutting of the transverse reinforcing rods in the bottom of the slab. To do this, chipping hammers were used to expose the rods along the center line of the underside of the slab, after which they were cut with an oxy-acetylene torch. Next, 2-in. holes, two between each pair of ties, were drilled through the slab along the center line to establish the break line. Then three 3-in. holes were drilled along the break line, one at each end of the slab and the third at the center, These holes were for the Roc-Jaks.

In the meantime timber cribbing was being set up under the slab to support the two 50-ton air jacks. One of these jacks was placed under each end of the slab on the center line. When preparations had been completed for breaking a slab it was raised slightly off the caps by means of the jacks. Actually what usually happened was that one side of the slab was lifted about an inch while the other side remained in contact with the cap.

J. W. Edwards, foreman, holds Roc-Jak preparatory to putting it in slab hole

As an aid in breaking each of the old slabs two 50-ton air jacks, placed underneath on the center line, were used to raise one edge of the slab slightly off the caps

Lowering a new cap into position. Note mortar joint on top of the pile encasement and steel channels for keeping cap in line

Work of renewing caps and slabs, which was done with a steam derrick, was carried out with little interruption from trains

With the slab thus supported by the jacks its weight was utilized to aid the splitting action of the Roc-Jaks.

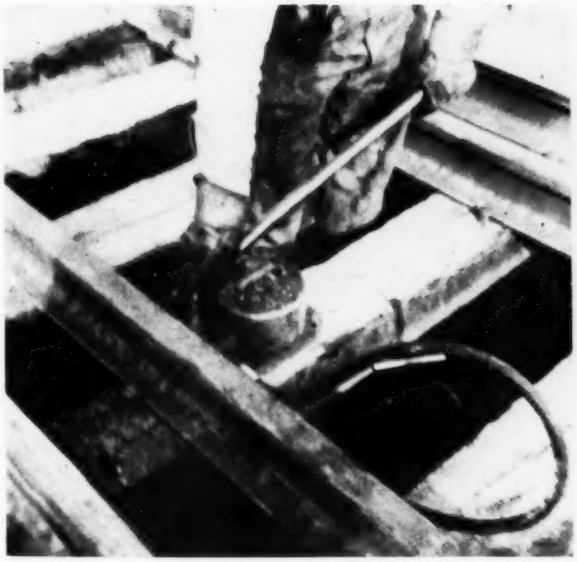
### Use of Roc-Jaks

At the time this work was inspected only one of the Roc-Jaks was being used, but the single unit proved quite sufficient to break a slab. In this operation the "jack" was inserted in the 3-in. hole in the center of the slab, along with a ¼-in. metal shim or 'feather." On the first application of hydraulic pressure to the jack the slab split cleanly from end to end along the center line.

When splitting a slab the objective was to spread the two pieces so that they were separated by a space of about ½ in. Although the pistons of the Roc-Jak have a "stroke" of about 1 in. the pieces of the slab often spring back almost to their original position after the initial split has been made. For this reason it was frequently necessary to remove the jack, retract the pistons and reinsert the jack with an additional ($^3/_{16}$-in.) shim. Sometimes it was necessary to use as many as three additional shims before the separated parts of the slab had been spread apart as much as desired. On occasion it was found that one or more transverse reinforcing rods remained unsevered, causing the slab pieces to spring back. If so, they had to be located and cut to permit the desired separation to be achieved. When a slab had been split and spread apart as much as desired, demolition hammers were used to deepen the grooves at the locations of the 3-in. end holes to provide adequate grips for the lifting cables.

### Renewing the Slabs

When the slabs between two permanent piers had been separated they were as stated, renewed before the gang went forward to the next group. The procedure in-



Usually only a few strokes of the handle of the hydraulic pump were needed to cause the slab to split along the break line

After removal the old slabs were piled alongside the bridge at one end. Note even break line in the top slab in foreground

A section of the north approach of the Burlington's Salt River bridge after the renewal work had been completed. As renovated the bents are actually solid piers

volved in taking out the old slabs and inserting the new ones (which were cast as half-slabs) generally followed conventional practice. Since the new slabs are somewhat less in depth than the old ones the tops of the existing permanent pier had to be increased in height sufficiently to make up for this difference. This was done by inserting precast concrete shims on top of each old pier at the time the slabs resting on it were renewed, first applying a ¾-in. mortar joint to compensate for irregularities in the top of the old pier. These shims were cast on the site at the same time that the new caps were constructed.

In connection with the work of renewing the deck slabs the caps of the bents were also renewed as the work proceeded. Preliminary to renewing a particular cap the old cap was shimmed up on the new encasement with oak wedges and, using air tools and an oxyacetylene torch to cut the reinforcing, the old piles were severed in the space between the new encasement and the old cap, being removed down to the level of the encasement. A ¾-in. mortar joint was also applied on top of the encasement before the new cap was set in place. Mortar joints topped with zinc sheets were likewise applied on top of the caps before new slabs were set.

To assure that the new caps would be kept in proper alignment relative to the concrete encasement, three vertical steel channels, set in grooves in the concrete, were applied on each side of each bend after the new cap had been applied. These channels are held in place by bolts extending entirely through the encasement and the cap.

### Work Done Under Traffic

The work of removing the old slabs and caps and inserting the new ones was done with the aid of a steam-operated derrick. This, and all the other work involved in the project, was carried out under traffic. Two passenger trains are operated over this line during working hours, which are scheduled to cross the bridge at 10:51 a.m. and 11:00 a.m. respectively. Ordinarily the crew engaged on the job arranged to eat lunch at about the scheduled time of these trains, with the result that they caused little or no interference with the work.

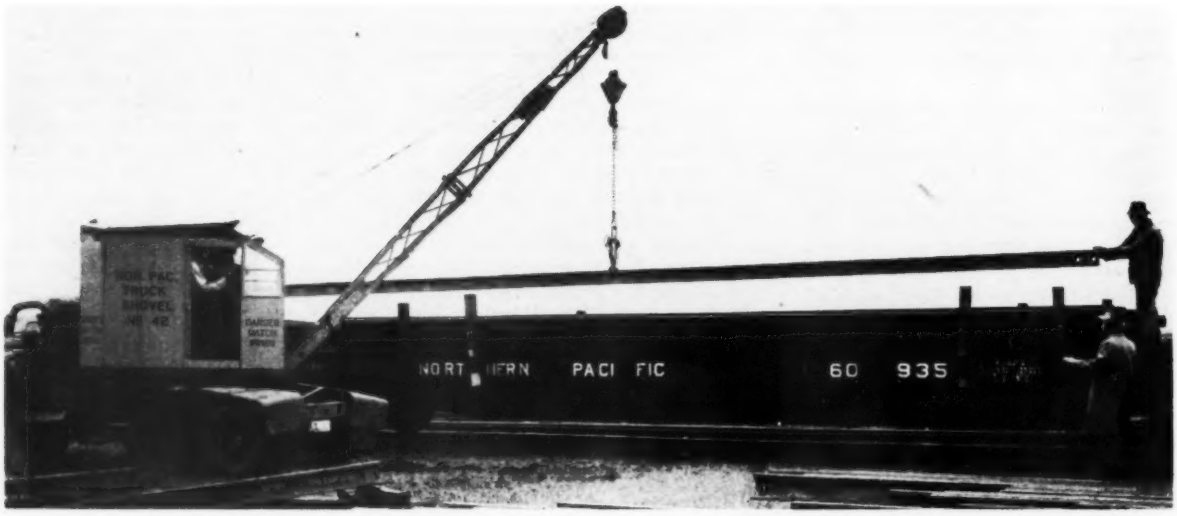
This project was carried out under the general supervision of H. R. Clarke, chief engineer of the Burlington Lines, and Frank H. Cramer, bridge engineer. L. L. Seeley, master carpenter at Hannibal, Mo., to whom we are indebted for some of the photographs presented with this article, had direct supervision over the work. J. W. Edwards was the foreman in charge of the gang that did the work.

The mobility of the truck cranes permits them to be used effectively at locations out of the reach of track-bound machines

## *Northern Pacific*

# Finds Truck Cranes Are Versatile Machines

• A fleet of truck-mounted shovel-cranes is reported to be rendering yeomen's service on the Northern Pacific in reducing the cost of many maintenance and construction operations requiring earth moving or materials' handling operations. It is pointed out that these machines require no expensive work-train service, and that they can be moved from job to job over the highways at relatively high speeds, saving the expense and delay of




The handling and laying of rail are still other operations for which the machines have been used to good advantage

**Another money-saving application which has been found for the units is the piling and loading of refuse removed from stock cars**

loading onto cars for train movement.

This road acquired its first truck crane in 1947, and at present is operating eight of them. Six are ¼-yd. units manufactured by the "Quick-Way" Truck Shovel Company, and two are Schield "Bantam" shovels. All are equipped with such interchangeable attachments as clamshell buckets, dragline buckets and trenchhoes.

One of the operations for which these machines are used is the cleaning of side ditches. In this work they have to some extent complemented the old-style ditchers which required work-train service. The handling and laying of rail are other operations for which they have been used to good advantage. Individual machines are reported to have laid as many as 125–115-lb. rails in mountainous territory in one day. Still other applications which the road has found for these units include bank widening; digging out ballast from between multiple tracks in preparation for re-ballasting; excavating basements and cesspools for new buildings: digging trenches for water and sewer lines; handling material around yards and shops; and cleaning stockyard pens. They are said to have proved particularly economical and efficient when used as aid in the construction of new tracks.

**All the machines are equipped with standard attachments which can be easily interchanged in the field as necessary**

CORRULUX is usually molded into corrugations to match corrugated roofing and siding. It can be nailed without cracking

Corrulux sheets can also be cut easily by hand or power saws, drilled, and bolted with standard hardware to structural members

# New Plastic Glazings Offer

**Lightweight, transparent or translucent panels—either corrugated or flat—admit adequate light, resist impact, are easy to install and require practically no maintenance**

● "Shucks, this ain't no fun," moaned a little vandal as the stone he had just thrown bounced harmlessly off of a plastic window in a warehouse.

His subsequent mumbled opinion that "there oughta be a law against using that stuff," wasn't shared by the carpenter foreman who watched from his nearby office. For years the foreman had had a continuous stream of notes "on the hook" ordering him to replace the window lights in that warehouse. "At last, it appears that we've found something to stop the constant drain on my miscellaneous

## Polyester Resin . . .

**. . . building panels are being marketed under three principal trade names:**

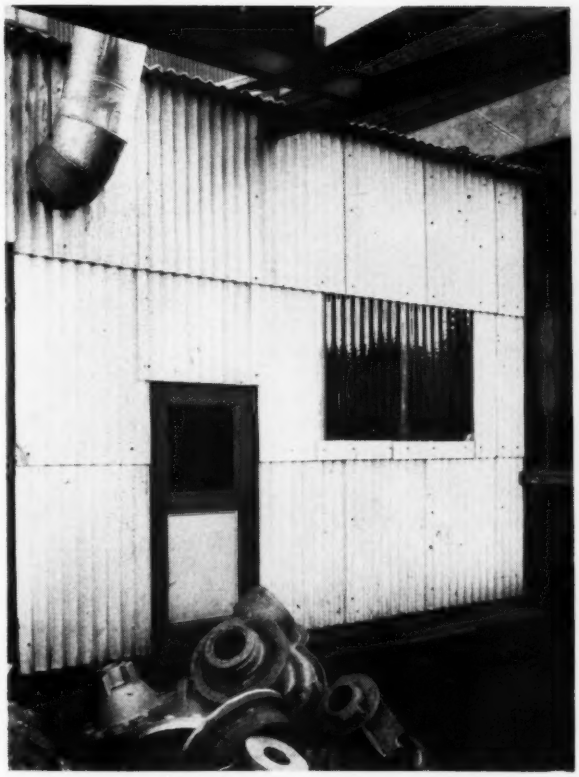
**CORRULUX**—A combination of Owens-Corning Fiberglas laminated with Laminac, Selectron and other polyester resins. It is reported to have a tensile strength of 7,500 to 10,000 psi. and a flexural strength of 10,000 to 15,000 psi. It is shatterproof, resistant to sun, rain, heat and cold. It is designed to eliminate glare yet it is said to transmit 60 per cent as much light as air, to conduct 60 per cent as much heat as glass, to retain its strength in extreme cold (-20 deg. F.) and not to sag in hot sunlight. It expands and contracts at approximately the same rate as aluminum.

Corrulux can be cut by hand or power saws, drilled, and bolted with standard hardware to structural members. It is usually molded into corrugations having frequencies of 1¼ in. or 2½ in to match corrugated metal roofing and siding and in frequencies of 4.2 in. to match corrugated asbestos-cement sheets. Manufactured by Corrulux Corporation, Houston 25, Tex.

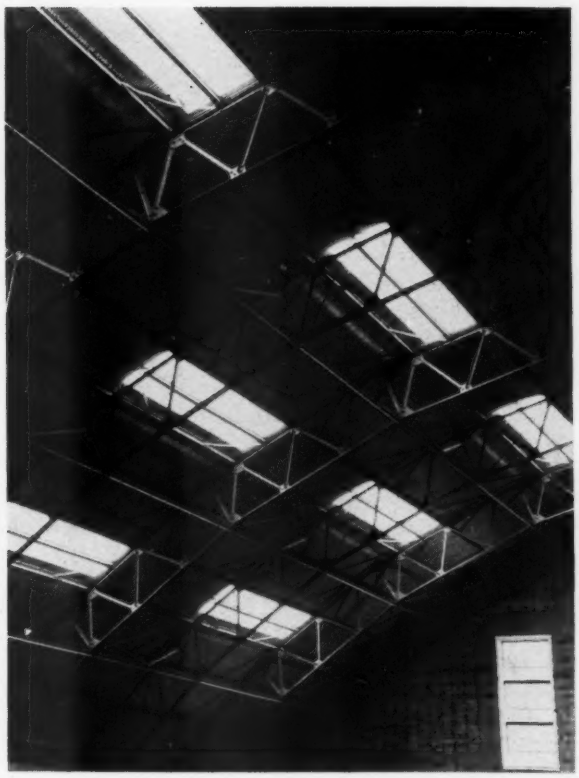
**DURALUX**—Similar to Corrulux, it is claimed to transmit 80 per cent as much light as air. Manufactured by Corrulux Corporation, Houston, Tex.

**ALSYNITE**—Made of Fiberglas mat and Laminac polyester resin. Usually molded into 2⅝-in. and 1¼-in. corrugations. Varies in thickness between 0.05 in. and 0.06 in. Weighs 7½ oz. per sq. ft.

It can be cut by hand saws, power saws, shears, or knives. It can be screwed or nailed in place or cemented with a special translucent mastic supplied by the manufacturer. The mastic can also be used to seal joints. It is said to withstand roof and wind loads "in excess of twice the usual code requirements" without failure. When used in skylights, it is said to be strong enough to permit a man to walk on it safely. Manufactured by Allied Synthetics Company, San Diego, Cal.



**PLEXIGLAS can be furnished in flat, transparent sheets, as in the door above, or in corrugated sheets, as in the window**



**A good example of the use of Plexiglas for skylights is found in the new field house (above) at the University of Delaware**

# Possibilities for Railway Use

repair costs," he said to himself as he sat down to requisition more of the "stuff there oughta be a law against."

Similar testimonials to the effectiveness of these relatively new plastic glazing materials are being heard throughout the country as other objects rattle harmless off of all sorts of installations, from skylights in industrial or railway buildings and windows in base-ball-park press boxes, to solarium roofs on hotel penthouses.

### What the Materials Are

Just what are these new materials? Basically they are either an acrylic, thermoplastic material known as Plexiglas or they are made from several polyester resins combined with inert glass fibers and called Corrulux or Duralux, or in a slightly different composition that is sold as Alsynite. The properties of these plastic glazing materi-

### Acrylic . . .

**. . . building panels and clear glazing sheets are sold under the trade name:**

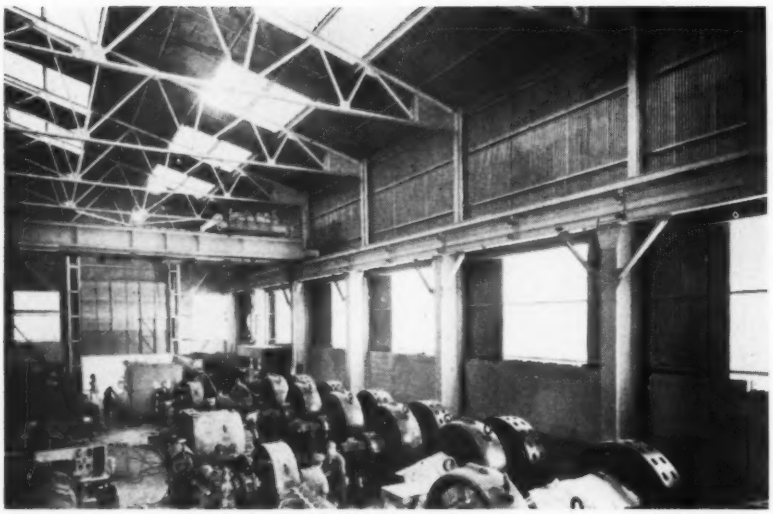
**PLEXIGLAS**—A thermoplastic material which, when heated above 212 deg. F., can be formed to almost any shape or curvature. This material is light, weighing less than half as much as glass. It is easily machined, making it possible to bolt sheets of it directly to corrugated metal or asbestos-cement sheets, eliminating the need for sash. It is said to have dimensional stability, a high degree of light transmission and diffusion, and to be shatter resistant. Finally, it is unaffected by outdoor exposure.

According to the manufacturer, some of its mechanical properties are:

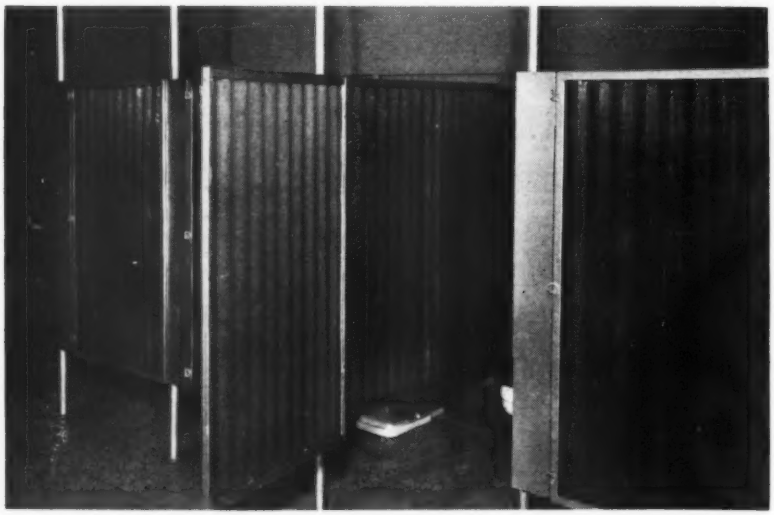
| | |
|---|---|
| specific gravity | 1.18 |
| tensile strength | 6,800 to 8,800 psi. |
| flexural strength | 13,000 to 15,000 psi. |
| compressive strength | 13,000 to 15,000 psi. |

Its impact strength is said to remain high at low temperatures and through long use.

Clear Plexiglas is claimed to transmit every color of the spectrum with an efficiency equal to that of the finest glass and to transmit 90 to 92 per cent as much light as air does. It is normally stocked in flat sheets or in two types of corrugations. In one type the corrugations have a frequency of 1 in. and an amplitude of ⅜ in. to conform to Robertson metal. Corrugations in the other type have a frequency of 2½ in. and an amplitude of 1 in. Both the flat and corrugated sheets are available in several thicknesses and in several standard colors, either transparent or translucent. Manufactured by Rohm & Haas Co., Philadelphia, Pa.



**Skylights and sidewalls of plastic glazings effectively daylight building interiors**



**Colored plastic paneling is being adapted to many different interior purposes**

als, both the polyester-resin type and the acrylic type, are described in detail on the preceding pages.

### Advantages of Plastic Glazing

Why has the use of these plastics caught on so rapidly? Mainly because they are reported to have three basic advantages over glass, either plain or wired, for industrial and railway installation:

(1) *They are light, but shatterproof*—and therefore offer attractive possibilities for use in areas where high breakage of glass has occurred because of vandalism or vibration.

(2) *They are easy to install*—They require no framing, can be cut by hand or power saws and some types can be nailed without cracking. Although in most cases their initial cost is higher than that of glass, their "in-place" cost is comparable to the cost of glass plus sash, plus glass installation.

(3) *Maintenance and replacement are negligible.*

However, probably the greatest force behind their rapid spread is the fact that, being thermoplastic, they are capable of being molded to match the corrugations of any of the metal or asbestos-cement roofings or sidewall materials. Thus they can nest with other panels of corrugated roofing or siding and, since they are shatterproof, can be fastened in the same way as the parent material comprising the rest of the building. Some forms of the thermoplastics can even be nailed (see detail descriptions on the preceding pages).

### Typical Examples

Railways have used Corrulux for skylights in new l.c.l. freighthouses where corrugated metal is the parent roofing material, in sidewalls and skylights of new shops, and warehouses covered with Transite, and for the replacement of ¼-in. flat wire-glass skylights in train sheds. Flat, transparent Plexiglas has been used for the replacement of window glass in at least one of the warehouses of the Railway Express Agency.

They have also been widely used in other industries. A good example of the use of Plexiglas for skylights is found in a new field house at the University of Delaware. There the plastic was matched to corrugated aluminum sheathing.

Each skylight measured 18 ft. by 5 ft., and was made up of 36-in. by 60-in. panels, ⅛ in. thick. These were joined at the edges by overlapping 1½ corrugations and bolting the panels together, using oversized holes and special resilient grommets to take care of expansion and contraction. Each of the 15-sq. ft. panels weighed only 12 lb.

### Use in a Warehouse

Plexiglas sheets, ⅛ in. thick were also used in an industrial warehouse at Bridesburg, Pa. In that installation the corrugations matched in amplitude and frequency those of the Robertson metal of which the rest of the building was covered. On the sidewalls, 33-in. by 51-in. plastic sheets were screwed to the structural members so as to overlap the sheets below but to fit under those at the top.

One of the steel mills in the Chicago area is reported to have used Corrulux to replace corrugated wire glass on which maintenance was excessive because of breakage. Other replacements of a similar nature have been made in mills primarily because of the ease with which the plastics can be installed.

Since all types of plastic paneling are available in a number of colors, architects are adapting it to many decorative purposes—as curved partitions in country clubs and department stores; as movable partitions in medical dispensaries, in offices and reception rooms; and as doors and partitions in public toilets. Such cosmopolitan installations suggest many similar uses on the railroads.

Section of heavy-duty main-line track on the Pennsylvania as seen shortly after it had been worked over by a spot-tamper outfit

## 13-Man Tractor-Compressor Outfits

# Take Over Spot-Tamping Work on P. R. R.

**For several years the Pennsylvania has been carrying out a policy of establishing specialized gangs, each equipped with a tractor-compressor, for spot-tamping track in territories ballasted with crushed stone. The reasoning behind this policy, its effect on the section gangs, and the organization and operation of the spot-tamper outfits are described in this article.**

• Until about 1945 much of the spot tamping of track on the Pennsylvania was done by the section forces using hand picks. Recognizing that this work in territory ballasted with crushed stone could be performed more efficiently and effectively with pneumatic tools, a program was undertaken to equip the track forces with portable compressors and pneumatic guns. In the beginning the compressors provided for this purpose consisted mainly of 105-cu. ft. units mounted on two pneumatic tires. Each of these compressors was equipped with a towing bar so that it could be hauled to and from the job by automobiles, highway trucks, or tractors.

Shortly after this program got under way the railroad began to investigate the possibilities of using for this work portable 105-cu. ft. compressors mounted on four-wheel tractors. It was considered that, since such units are self propelled, they could be readily maneuvered along the track by one man and that they could be used also as towing units for toolboxes mounted on trailers. In addition, since various types of attachments are available for use with the tractor-compressors, consideration was given to the fact that they are "all-season, many-purpose" machines that can be employed with economy for numerous other operations.

Hence, in about 1947, the railroad began buying the 105-cu. ft. tractor-compressors for the spot-tamping work, and by the end of the 1950 working season it had 80 of these units in service. Additional purchases have since been made with the result that the Pennsylvania now has 121 of the tractor-compressors in service. Tentative plans call for the purchase of additional machines of this type in 1952. The tractor-compressors purchased on the Pennsylvania are of two makes, namely, the Tractair, made by the LeRoi Company, Milwaukee, Wis., and the Pneuma-

**The tractor-compressors not only are mobile power plants but are used as towing units for trailers in which tools are carried**

tractor, made by Schramm, Inc., West Chester, Pa.

It should be emphasized that the tamping work done with the tractor-compressors is only of the "spot" type and that, in conducting out-of-face surfacing operations, the railroad will continue to rely principally on large on-track machines to do this work at a minimum cost per foot of track tamped.

### Gangs Have 13 Men

For the most efficient use of the 105-cu. ft. tractor-compressors for spot-tamping work the Pennsylvania has more or less standardized on a basic organization consisting of 12 track men and a foreman. Eight pneumatic guns are provided with each of the outfits, and hence eight of the men are normally engaged in operating these tools. One of the men acts as a machine operator, another handles the jacks, a third fills in ballast, and a fourth acts as a watchman. In his spare time the machine operator may do such odd jobs as helping to fill in ballast, etc.

Each of the spot-tamper gangs has a permanent headquarters, is assigned a definite territory and works under the direction of the track supervisor. The gang is usually transported to and from work in a highway truck or bus, although in terminal areas train service is frequently used to get the men to and from the job. To provide a means of carrying tools without "lugging" them manually, many of the gangs are each provided with a tool trailer mounted on two pneumatic tires for towing behind the compressor. Mounted on the trailer is a toolbox approximately 4 ft. by 8 ft. by 1½ ft. in dimensions.

When putting the spot-tamping outfits into operation on a particular division or territory the practice has been either to lengthen the sections or to reduce the size of the section gangs, or both, and to incorporate the men thus released into the spot-tamping crews. Because the policies followed not only vary in this respect, but in others also, it is necessary to cite specific examples in order to show what effect the use of spot-tamper outfits has had on the road's track maintenance organization as a whole, and to illustrate other pertinent features relative to their use and operation. Two divisions that afford contrasting practices and experiences are the Eastern division of the Central region, and the Ft. Wayne division of the Western region, and the policies in effect on each of these divisions will be described in some detail.

### Practices on Eastern Division

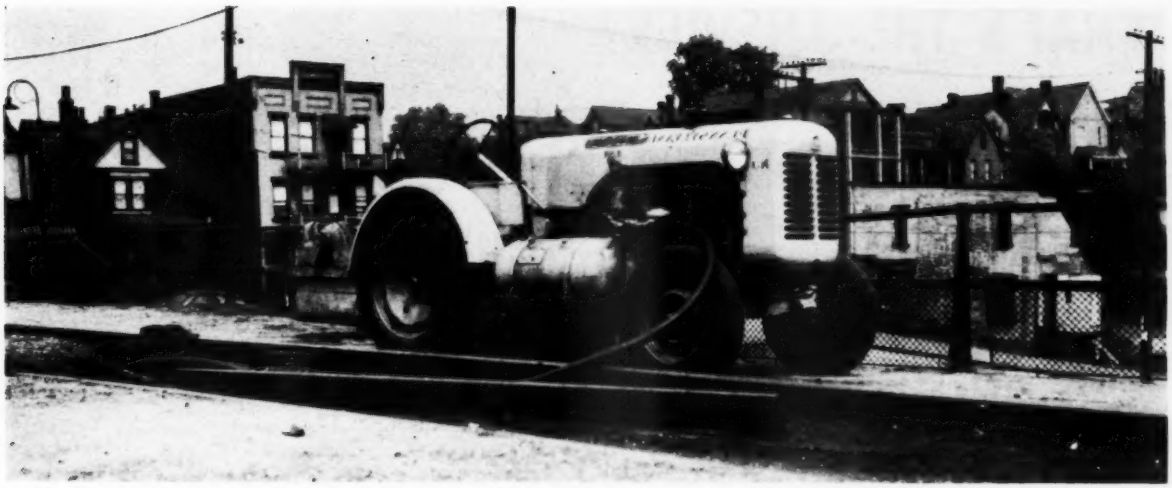
The main line of the Eastern division extends from Pittsburgh, Pa., on the east, to Crestline, Ohio, on the west, a distance of 187 miles, and consists of two, three or four tracks, ballasted with crushed stone throughout. Before the 13-man crews were established on this division for doing the spot-tamping work, there were 59 sections, on each of which the gang normally consisted of four to six men, in addition to the foreman. The tractor-compressor outfits were first put into service on this division for doing spot-tamping work in 1948. Based on the experience with these outfits in that year and in 1949, the track maintenance setup was extensively revamped in 1950. In this reorganization 15 of the 13-man gangs were established to handle all of the spot-tamping and track-lining work on the main line of the division. At the same time 17 sections were discontinued, and the remaining sections lengthened accordingly. Simultaneously, the number of men in each section gang was reduced, with the result that these crews now have two to four laborers. The men released from the section gangs were incorporated in the spot-tamper crews, so that it was not necessary to add additional men to the labor force.

From the early experience with the spot-tamper outfits on the Eastern division it was determined that each of them, spending practically its full time on such work, would be able to do the spot-tamping and lining on 34 miles of track a year. Hence, the territorial assignments on the Eastern division were made on this basis. On this division each of the gangs stops its spot-tamping work in time each day to permit it to go back and do any necessary lining work before quitting time.

As the result of experience gained on the Eastern division, 13-man spot-tamper gangs have also been established on the other main-line divisions of the Central region, namely, the Pittsburgh and Panhandle divisions. In establishing the gangs on these divisions the practices of the Eastern division were used as a model.

### On the Ft. Wayne Division

The Ft. Wayne division extends from Crestline on the east to Hobart, Ind., on the west, a distance



All of the tractor-compressors used by the spot-tamping gangs on the Pennsylvania have a capacity of 105 cu. ft. per min.

The tool trailers are large enough to carry all tools needed by the gang. Bus in background is used for transporting the men

of approximately 250 miles. The main line on this division consists largely of two tracks ballasted throughout with crushed stone. Before the 13-man spot-tamping gangs were adopted on the Ft. Wayne division the practice here for a number of years had been to assign portable two-wheel compressors to the section gangs on a temporary basis for doing spot-tamping work. When one of these compressors was assigned to a section the gang was enlarged temporarily to permit the spot-tamping work to be carried out on an efficient basis.

The 13-man spot-tamper gangs were established over the entire main-line mileage of the Ft. Wayne division early in 1950. On this division these outfits are better known as "section-maintenance" gangs. One such gang was assigned to each track supervisor's territory. There are five supervisors on the main line of this division, and each of them has an average of 50 miles of line (about 100 miles of main track). The section gangs on this division were not lengthened, but the gangs were reduced in size an average of slightly more than one man each, the men thus displaced being incorporated into the spot-tamping outfits.

### Work of the Gangs

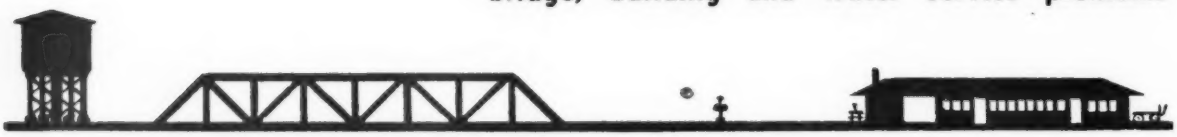
As on the Eastern division, the spot-tamper gangs on the Ft. Wayne division devote their entire time to the tamping work, except that, when the track freezes during the winter months, they turn their attention to track-gaging work. If weather conditions should interfere with this work the gang may be used for other operations, such as cutting brush or helping out with snow-removal work.

Since the five 13-man gangs on the Ft. Wayne division are not sufficient to do all of the spot-tamping work in this territory some of it still must be done by the regular section gangs. For this purpose the practice is being continued on this division of assigning two-wheel portable compressors to some of these gangs during the working season on a temporary basis.

By putting its spot-tamping work in the hands of specialized gangs using highly mobile, mechanized equipment the railroad is assuring itself that the work will be carried out at minimum cost, that uniform, high-quality work will be obtained, and that a generally higher standard of track maintenance will be achieved.

# WHAT'S THE ANSWER?

**An open forum for maintenance men on track, bridge, building and water service problems**



## Where and When to Repair M. W. Trucks

How should the repair of auto trucks assigned to m/w use be planned and executed? Where should this work be done? Explain.

### Repair at Inspection Points

By A. H. Whisler*
Assistant Engineer, Pennsylvania, Philadelphia, Pa.

On the assumption that all M. W. trucks are subject to call in emergencies, they should be inspected after every 1,000 miles of operation or each 30 days, whichever occurs first, and kept in good condition. Repair work on them should be programed and carried out in such a way, as to result in the minimum amount of out-of-service time.

Most M. W. trucks fall into one of two categories: (1) Those headquartered in, or within 20 miles of, terminal areas where railroad-owned, operated, properly manned and equipped shops are available to inspect and repair them; or (2) those headquartered elsewhere. Arrangements should be made to have these trucks inspected at some local garage authorized to make minor repairs.

Serious consideration should be given and arrangements made, if possible, whereby trucks are inspected and repaired between 5 P.M. and 5 A.M., the hours when most M. W. trucks are not in active use.

Inspections made at the intervals suggested will disclose many worn or defective parts which will not justify removing the truck from service but for which replacement parts should be procured and installed or applied at the next inspection time.

At the end of each tour of work drivers or chauffeurs should make a written report on the speedometer reading and on faulty or defective conditions noted during his tour. These reports should be reviewed at each inspection time and, if practicable, made a matter of discussion between the driver and the repairman at the time the truck is delivered to the shop or garage for inspection and minor repairs.

Major repairs or overhauls, including repainting, etc., should be concentrated and performed at a central shop. This work should be planned and programmed in accordance with needs indicated by reports made at the 1,000-mile or 30-day inspections.

"To what extent should inspections be made?" "What constitutes minor or major repairs?" and "How complete should reports from drivers be?" are very controversial questions, the answers to which can only be found in statements concerning service life, dependency and return on the investment expected of or from the vehicle.

### Make Plan Fit Circumstances

By N. W. Hutchison
Engineer Work Equipment, Chesapeake & Ohio, Barboursville, W. Va.

The planning and execution of repairs to maintenance-of-way trucks owned by any railroad must, of necessity, be based upon the number of trucks to be maintained, the shop facilities provided with which to make the repairs, and the adequacy of the work equipment organization to do the planning.

For those railroads which have relatively few trucks, no shop fa-

* President, Roadmasters' and Maintenance of Way Association of America

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**Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.**

### To Be Answered In The April Issue

1. What considerations determine whether a stretch of track should be given a light out-of-face raise or be spot tamped? Explain.

2. What type of material should be used to make a fill on which a concrete freighthouse floor is to be placed? What methods should be used in placing the fill to secure a uniform support for the floor?

3. Under what conditions, if any, should new rail be used for replacing broken or defective rails in main track? What alternatives are acceptable? Explain.

4. When renewing a pile trestle, should the piles in the old bents be pulled or cut off? Why? If the latter, at what point should they be cut? Why?

5. When ties are being renewed ahead of an on-track tamping machine, what is the most economical way of assuring the proper distribution of new ballast? Explain.

6. How can leaks in water mains, air lines, and steam lines be curbed or reduced? Explain.

cilities, and no work equipment organization, little or no planning is necessary and the repairs to trucks will, ordinarily, be made at local garages. On the contrary, those railroads which have a large fleet of trucks and one or more repair shops which are equipped with modern tools and machines, along with an adequate work-equipment organization, must plan their truck repairs in such a way that the repair costs are held to a minimum, and so the truck is kept out of service the minimum amount of time.

The planning for truck repairs should be under the direct control of a superintndent of work equipment, and shop repairs should be performed by shop mechanics, under the direction of a divisional supervisor of work equipment.

The chauffeur, or operator, of a truck should be required to give his truck perfunctory daily inspections to insure that it is kept in a safe condition and, through his daily inspection, he is in the best position to call to the attention of the work-equipment mechanic, any defects that arise, or any failures that occur. The latter should also be required to give the truck periodic inspections and advise his supervisor of work equipment of any extensive repairs that need to be made.

If the required repairs are likely to involve the shopping of a truck, a decision must be made as to whether the truck can be put in the local company shop, whether it should be sent to a central company shop, or whether the work should be done at a local garage. If it is decided to repair it in a company shop, arrangements must be made with the shop supervisor to place the truck in its proper sequence on his shop program. Where a relief truck is available, it should be furnished to the force to which the truck to be repaired is normally assigned, so that the completion of its work will not be delayed. Such a program of planning makes it possible to anticipate the repairs that will have to be made to a truck and gives the shop supervisor an opportunity to program his work so that the vehicle remains at the shop the least amount of time.

The choice of the place to repair a truck is dependent upon several factors, such as the extent of the repairs to be made, the distance the truck must be driven or transported to a shop, whether or not the repairs are of an emergency nature, how long the truck may be kept out of service, whether it can be worked into the shop schedule at an early date, whether a relief truck is available, and others. Generally, such things as greasing, oil changes, tire repairs, etc., may be done more cheaply at a local filling station and should be looked after by the truck operator, or foreman. Under ordinary circumstances, shop repairs may be made more cheaply by company mechanics in a company shop rather than at an outside garage, because no profit is involved. However, when there is no local company repair shop, when the company shop is not equipped with the necessary tools or machines, or when the central shop is at a great distance from the truck headquarters, it is often less costly in the long run, to have the work done at a local garage. Each case must be given individual consideration and a decision reached from a practical and economical standpoint.

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# Protecting Head Bonds When Welding

What is the best way to protect rail-head bonds from the excessive heat of rail-end welding or heat-treating operations? Why is protection necessary? Explain.

### Harden Rails Before Bonding

By R. M. Baldock
Welding Engineer, Norfolk & Western, Roanoke, Va.

In the past we have used many pin-terminal signal bonds attached to the side of the head of the rail. When building up the rail ends by welding, it is necessary to remove this bond, both to prevent injury to the bond and to permit a flatter to be used on the side of the head of the rail. Unfortunately, many of the bond terminals break off regardless of how much care is used in extracting them. To get good contact after the weld has been completed, it is necessary to clean the oxide out of the hole by means of a drill or a reamer. Sometimes the bond terminal breaks off in the hole. In that case it is necessary to drill a new hole. In most cases it is possible to reuse the old bond, but sometimes it is necessary to replace them with new bonds. Because of the difficulty in removing and reapplying bonds when building up rail ends by welding, we are now using a long bond attached to the web of the rail by means of pin terminals.

If the rail ends are to be hardened in the field, this work should be done before the bonds are applied if possible. If it is necessary to do the end hardening after the bonds are applied, the bond can be protected from the heat by covering it with moist asbestos cement. This cement can be easily removed and reapplied.

### Coat Bonds with Asbestos

By E. H. Ness
Supervisor Work Equipment & Welding, Erie, Cleveland, Ohio

We have welded or heat-treated rail ends for a number of years by the oxyacetylene process. The matter of protecting the bonds from the excessive heat of the welding torch is a problem to which we pay very strict attention because it takes only a little heat to destroy or shorten the life of a bond. To protect the bonds we use the following procedures.

*When rail-end welding is done* —Ground asbestos is mixed with water in a bucket to a soft consistency so it will cling together and stick to other things. This asbestos mixture is then applied to the bond and the side of the rail head until it covers the entire bond. In making the application, however, it is kept as far down the side of the rail head as possible so as not to interfere with the welding operation. If the asbestos is properly mixed and applied, bond failures and replacements are very few.

*During heat treating of rail ends* —We use a shield made from ⅜-in. boiler plate, 3½-in. wide by 6 in. long, to which a piece of ½-in. by 3½-ft. pipe is welded at a suitable angle so a man can stand on the subgrade and place the shield directly over the bond and hold it as tight as possible to the side of the two rail heads while heat is being

applied to the surface of the rail. To prevent the flame from going between the edge of the plate and the rail, care must be exercised to keep a good flat surface on the edge of the boiler plate that is placed next to rail.

### Replace All Head Bonds

By Bernard Geier
Supervisor, Work Equipment & Welding, Delaware, Lackawanna & Western, Scranton, Pa.

Our standard method of rail-end welding is by the oxyacetylene strip method, in which a 1¾-in. to 1¾-in. strip of new metal is applied down the center of the railhead. This method, in which the operator can weld from 1½ to 2 in. per minute, probably introduces as little heat into the rail as is possible in any oxyacetylene method. We have tried various methods of protecting rail-head bonds but invariably some signal failures have occurred because of oxidation in the bond hole. Therefore, we replace all rail-head bonds on welded rail ends.

In heat-treating operations we find that asbestos mixed with water into a paste and applied around the bonds gives them the best protection. In providing this type of protection, two laborers can easily keep up with the machine, one applying the paste and the other removing it, for reuse later, after the heat-treatment has been completed. The asbestos does not discolor the bonds, the terminals remain perfect and no oxidation occurs in the bond holes.

However, we have now standardized on a long solid copper bond that is placed under the angle bar. Bonds of this type should be far superior to head bonds, particularly on railroads that heat treat their new rail and weld a large amount of rail ends.

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# Should Equipment Fuel Be Filtered?

What effect does foreign matter in the fuel have on the performance of roadway machines powered with diesel or gasoline engines? To what extent can filters be used to assure cleanliness? Explain.

### Fuel Isn't Clean Enough

By C. F. Ahern
Sales Department, Commercial Filters Corporation, Boston, Mass.

Experience, both in the field and in the laboratory, has already given the answer to the two questions posed. It is an established fact that contaminated fuel of any type restricts the efficient performance of combustion engines. Secondly, filters have been specified as standard equipment by makers of all types of diesel-powered machines for many years, indicating strongly that it was recognized long ago that efficient engine performance is predicated on fuel being free of all foreign matter—fuel clarified effectively and inexpensively through the use of the replaceable-element type of filter in the fuel line.

As a start, let us analyze the fuel itself as it enters the fuel line. Such an analysis would show that there are three types of contaminants present in this fuel as it is supposedly ready for use:

(1) *Abrasive materials* consisting of metal particles which, although not necessarily present in the fuel delivered to the supply tank, are picked up by the fuel after it enters the engine fuel system. This abrasive material is usually present in an engine after its fabrication or originates from the wearing down of certain metal particles. In any pipe line, too, there is also present such abrasive material as rust, pipe scale, and the like.

(2) *Gums, tarry residues, and slime*, which any analysis will show are always present in some degree in petroleum products. These contaminants seem to occur especially after a lapse of time as a result of oxidation and breakdown of the oil.

(3) *Water*, caused either by condensation in the supply tank or by direct contamination through careless handling.

Efficient performance of any engine requires the almost complete removal of all of these contaminants with the sole exception of the water, which will not materially affect the power generated by the engine as long as it is in a finely sub-divided form and present only in minute quantities. The most delicate mechanism of any diesel engine is, as you know, the injection nozzle. This can become easily affected or clogged by minute solid particles in the fuel, and manufacturers of diesel equipment in their instruction manuals markedly specify cleanliness of fuel as the primary factor in efficient performance. Therefore, since experience has definitely shown that efficiency is impaired by the presence of the above contaminants in the fuel itself or when picked up in the fuel system, an inexpensive yet fool-proof system must be a necessary part of the diesel equipment to assure contaminant-free fuel reaching the injector nozzle.

There are various methods for clarifying liquids, provided space, time, and cost are of no importance. Since all three factors must be considered if the unit is to be a component part of any diesel plant, the simple replaceable-type filter had to be the answer. How well does this medium do the job at hand?

First of all, removal of abrasive contaminants is relatively easy, but the gums and tarry residues and slime present a difficult problem, both because of the reasons for and the difficulty of their removal. While the gums do not score the fuel injection mechanism, they will, however, in time foul it sufficiently to impair its efficiency. This is particularly true of the nozzles, since gums and the like will carbonize on the nozzles and clog them.

These gums, however, are more difficult to remove than the suspended abrasive particles, since unlike these abrasive particles, they do not form a porous cake which could act as a filter in itself, but rather form a non-porous film on the surface of the filter element. This film tends to clog most elements, particularly at low operating temperatures and where the amounts of the gums is rather large. Therefore, a very definite type of filtering element is necessary.

The removal of water is not considered too important, because an analysis of any fuel before it enters the fuel line will show that the amount of water is usually not too great. Any large quantities of subdivided water will, however, without a proper filter, result in water getting into the injection system in a sufficient quantity to reduce the efficiency of the engine and eventually to cause its complete stop-

(*Continued on page 70*)

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page—a stoppage which is likely to be a prolonged one, due to the difficulty of cleaning the water out of the injection system. A proper filter, however, will knock down the greater part of the water into the filter sump where it can easily be drained without interrupting the operation of the engine.

To remove the three types of contaminants, then, that are usually present in delivered diesel fuel, a single filtering system should be devised. The filter container should be compact. It should have suitable connections to minimize the amount of piping necessary for its installation on the fuel system. It should be rugged in construction to meet the unusual conditions that may prevail in the field. Finally, it should be designed so that the elements can be easily changed without extended down time.

Laboratory and engineering tests have shown that the replaceable-element type of filter, particularly that filter incorporating elements made from a cotton yarn or roving, precision wound on a metal screen or core produces the best results. With this type of filter, abrasive particles, even below 5 microns in size, are removed, along with most gums and tarry residues and any dangerous amount of water.

Any product, whether it be filters or diesel engines, is popular only to the extent that it can be easily maintained and serviced. The filters in use on most diesel equipment are of simple construction, enabling field mechanics to change elements with ease. Installations sometimes feature a duplex arrangement whereby one set of elements are changed while another set continues the cleaning operation. The wound cotton-yarn type of replaceable element is particularly desirable because its construction prevents rupturing, channeling, and by-passing. Composed of hundreds of minute channels, the contaminated fuel is successively filtered through many fine cotton films of gradually increasing density. The spaces between these films form cells where collected impurities accumulate and are stored. The advantage is presently apparent—these cells prevent the blinding effect of surface loading and give greatly increased tube life. Filtering elements which may filter satisfactorily but which, due to their construction, have a short life are not desirable because of extra time involved in the increased number of changing operations, and the increased cost of maintaining the filter.

In brief, then, deliverable diesel fuel is not sufficiently clean for top efficient performance of standard diesel equipment: The troublesome foreign matter present, however, can be removed quickly and inexpensively by compact filters incorporating the precision-wound, cotton-yarn type of element.

# What Size Fuel-Oil Storage Tanks?

When establishing new diesel fuel-oil storage facilities or enlarging existing facilities, what type and capacity of tanks should be used? What precautions should be taken in their construction? Explain.

### Provide for 30-day Supply

By C. L. Waterbury
Assistant Engineer, Chicago, Milwaukee, St. Paul & Pacific, Chicago

Diesel fuel-oil storage should be adequate to assure regular operation of trains in the event scheduled delivery from normal sources of supply is interrupted. To minimize switching costs and storage in tank cars, tanks used to supply current needs should contain not less than the requirements for one week at maximum demand rate. It is recommended that storage be provided for not less than 30 days, preferably 60 days, to protect against interruptions of supply due to floods, strikes, or severe storms and to permit taking some advantage of fluctuating prices. Such storage volume will minimize the handling during periods of peak traffic and during severe weather.

The construction of more than one storage tank at a location is a problem of economy. Larger tanks generally provide storage at a smaller investment cost per gallon. Multiple-tank installations, however, facilitate the rotation of oil stocks, separation of summer and winter grades, protection against contamination of the entire supply, reduction of fire hazards, and possibly better utilization of irregularly shaped or limited storage sites.

Tanks 12 ft. or less in diameter can be shop-fabricated and shipped on railroad cars to save the expense of field fabrication at small or inaccessible storage points. These small tanks are readily relocated if any problem arises because of changeable operating conditions (as on branch lines, large but temporary construction projects, etc.).

Tanks having capacities of 35,000 gal. or less may be supported above ground in a horizontal position on reinforced concrete or steel saddles. This type of construction not only facilitates the draining of the tank by gravity, but supports tanks above the elevation of standing surface water, and makes painting easier.

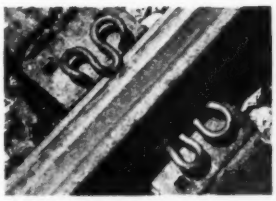
Underground tanks are expensive to construct, require heavier construction, including a concrete slab or other anchorage to prevent them from floating when empty, and are subject to the maximum surface corrosion which cannot be readily observed and combatted. Undetected leakage may result in costly loss of fuel, fire hazard in nearby basements or sloughs, damage to soil in nearby cultivated fields, or objectionable infiltration into sewers. Underground storage tanks may be required in congested areas where there is insufficient space for above-ground construction and for necessary fire-protection arrangements.

Railroads have generally favored vertical, cylindrical above-ground tanks with flat bottoms and conical roofs of welded gas-tight construction. This provides storage at the least investment per gallon with less steel than underground tanks, and possibly in less space than required for horizontal tanks. Vertical tanks should be located above high-water level or should be protected by dikes to eliminate any possibility of being floated or washed away in floods.

Tanks having capacities ranging from 12,500 bbl. to 55,000 bbl. have been built for railroad use with floating roof construction. This construction increases the initial cost of tanks per gallon of storage by approximately 50 per cent, but eliminates the need for a perma-

(*Continued on page 72*)

# It's NEW...It's PROVED!



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nently piped fire extinguishing facility, as there is no vapor space above the oil in which a fire could start. The hazard of fire is considerably reduced by the floating-roof type of construction.

Foundations for vertical above-ground tanks, 40 ft. or less in height, may consist of a graded crushed stone base 10 in. or more in thickness with a 3-in. sand cushion well mixed with a sulphur-free oil (by a concrete mixer, by "wind rowing" with a grader, or by hand). An excellent base can also be obtained by substituting about 1½ in. of asphalt road paving mix for the sand cushion. The diameter of this foundation should be at least six feet greater than the tank diameter, or should be retained by a concrete curb wall. Asphalt paving should cover the exposed berm of rock and sand base. It is customary to provide a crown of about one inch for each 10 ft. of radius, limited to six inches for large tanks.

Foundations at locations having a soil-bearing capacity of less than 3000 lb. per sq. ft. will require special design—either a concrete ring wall, a concrete slab to spread the load or possibly a slab supported by piling. Tanks erected on poorly drained grades, directly contacting corrosive soils or mixtures of different types of soils are subject to electrolytic attack. If possible, avoid situations where a tank rests partly on a cut and partly on fill. If this cannot be avoided, be sure the fill is thoroughly compacted and retained against lateral movement by means of an adequate berm or a concrete ring.

Good foundations are especially important for high, small-diameter tanks which may lean from a vertical position and threaten to fall, and for large tanks in which distortion may be excessive. The shoe-to-shell fit of a floating roof is best maintained if the tank shell is circular and does not become distorted by irregular settlement.

All diesel fuel-storage tanks should be provided with gas-tight manholes one in the roof and one at the bottom, to facilitate the circulation of air and removal of fumes if it becomes necessary for men to enter the tank. They should also have couplings for an inlet and an outlet pipe, a vent pipe, a gauge, drain and sampling connections. Vertical tanks should also be fitted for an escapement valve in the roof and an outside and an inside ladder with a safety cage.

Water and sediment accumulations may be removed by water-draw cocks placed in the bottom of tanks, or by siphoning or pumping through pipes which draw from the bottom of the tank.

All tanks must be grounded to permanent moisture as a protection against static or other electrical currents. Vent sizes, thickness of steel plates and similar details of design must comply with the Standards of the National Board of Fire Underwriters for the Installation of Containers for Storing and Handling Flammable Liquids (pamphlet No. 30). N.B.F.U. Pamphlet No. 11 covers the Standards for Foam Extinguishing Systems.

In at least one instance, a riveted elevated steel water tank was converted for diesel fuel storage by installing an emergency valve in the outlet pipe connection and encasing the tower legs with Transite pipe fireproofing. However, storage tanks are usually located in congested areas where fire hazards would rule against such a conversion even though otherwise economically practicable.

## Old Water Tanks Unsatisfactory

By W. D. Gibson
Water Service Engineer, Chicago, Burlington & Quincy, Chicago

In establishing new or enlarging existing diesel fuel-oil storage facilities, the type and capacity of the tanks involved should be governed by both the present and anticipated future requirements. Another governing factor is the location of the facility with respect to the primary source of supply.

It is presumed that most railroads have an established policy covering the amount of fuel which they store on line with respect to their consumption. One road with which we are familiar endeavors to maintain a minimum supply equal to the requirements for 45 days. Most of this reserve is located at three strategic points, all with reasonable access to the source of supply and central to the areas of greatest consumption. This permits fullest utilization of the company-owned fleet of tank cars.

Each of the reserve storage tanks has a total capacity of approximately 2,500,000 gal. and is so arranged as to receive or discharge oil from or to tank cars. The tanks are protected by automatic fire protection systems.

The capacities at regular fueling points should be dictated by the amount of fuel issued. A capacity of from 15 to 21 days requirements is advisable and the tank should be large enough to take a full carload while there is still at least one week's supply in it. Such an arrangement will enable the stores department to maintain a regular program of oil shipments.

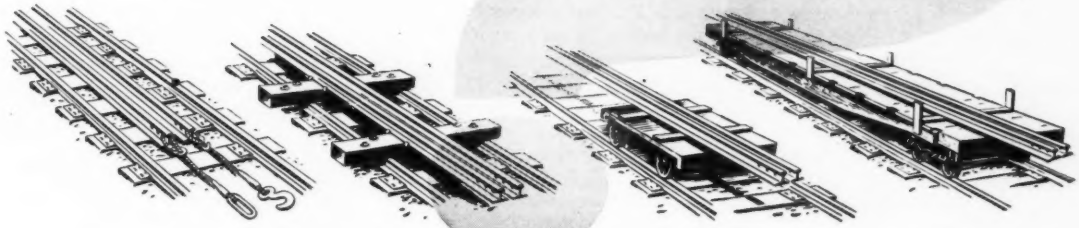
The handling of diesel fuel has evolved as the use of diesel locomotives has increased. Early installations were made for one or two locomotives, using such tanks as were available. Capacities were small, and it was considered advisable from a fire prevention standpoint to bury them. Later, when greater storage was needed and the cost of burying the tanks became prohibitive, above-ground tanks, properly diked, were used.

During and after World War II, at the time when the use of diesel locomotives was expanding very rapidly, it was practically impossible to obtain the steel for new tanks, consequently it was necessary to canvass the country for tanks which had been made surplus due to the curtailment of the sale of gasoline for public use. Many tanks were obtained from this source. In dismantling and re-erecting these tanks at other locations, considerable difficulty was experienced with most of the riveted tanks. It was found very difficult to make them tight enough for diesel fuel without resorting in many cases to welding in addition to reriveting. This experience led to the conclusion that all tanks of any capacity should be welded.

More recent developments in the tank situation have resulted from the elimination of many water stations, a considerable number of which had steel water tanks of various capacities. It was felt that these tanks could be dismantled and moved elsewhere for use as diesel-fuel storage tanks, but almost invariably the experience has been that the single-riveted construction in vogue for water tanks, is unsatisfactory when re-erected for use in storing oil. From this experience, dismantling and re-erection of single-riveted water tanks for the use of storing diesel oil is generally not favorably recommended. There have been instances, however, where fairly new water tanks have been successfully converted for the storage of oil, but in each case they were used in the same location without being dismantled.

(*Continued on page 74*)

# What's the best way *to transport* "RIBBONRAIL"



**DRAGGING?**

. . . fastening a chain or wire cable to the end of a long length and dragging it to the laying site.

**SKIDDING?**

. . . using skid ties to serve as runners on the rail in track. Welded rails are placed on skid ties and held by rail anchors.

**PUSH CARS?**

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# Is Highest Quality Paint Economical?

In view of present high labor costs, is the application of quality paints made by reputable manufacturers more economical over the long term than the use of lower-priced paints mixed according to specifications of individual roads?

### Best Is Most Economical

By H. M. Harlow
Assistant General Supervisor, Bridges & Buildings, Chesapeake & Ohio, Richmond, Va.

It is generally conceded that the paint that provides the best and longest protection to the wood, metal or masonry to which it is applied is the cheapest paint in the long run, because the labor cost of surface preparation and paint application is much greater than the cost of the paint. The cost of applying a paint of three or four years' life expectancy is the same as applying one having a life of six to eight years. Even if the paint with the longer life costs twice as much as the inferior paint, the annual cost of the paint job itself will be much lower for the higher priced material. Therefore, the best paint is the most economical paint.

Thus, the question automatically becomes one of whether quality proprietary paints are superior to paints made in accordance with specifications of the purchaser. There are pronounced differences of opinion on this subject and to make a positive concluding statement would be impossible of justification.

Proprietary paints of high quality generally are based on superior research and are technically more modern in their formulation. They have the definite recommendation of the manufacturer and in this way place that company in a position of responsibility as to performance. Production costs of proprietary paints should be less than costs for specification paints because of the larger volume being manufactured. This should be reflected in the price.

Specification paints are usually paints of "tried and true" quality and good performance is to be expected. More competition as to price can be anticipated, since all prospective suppliers will be bidding on the same formulation. However, paints that give superior performance under specific conditions sometimes may be rather difficult to obtain except by specification.

In conclusion, it can be safely stated that good paints can be obtained under either method of purchase and the efficiency of the supervision alone will determine whether or not this is done.

### Paint Less with the Best

By A. H. Simon
Engineer of Buildings, Chicago, Burlington & Quincy, Chicago

I have discussed this with our master painter and he and I are of the same opinion, namely, that, since labor costs are so high today, it is essential that a high-grade paint be used. The paying of a little higher price for paint is quickly offset by the fact that it takes a good many man-hours to apply it and also to prepare the surface for it.

It is certainly my opinion that high-quality paint is much more economical to use than lower-priced paints mixed according to various specifications.

# Why a New-Type Reinforcing Bar?

How do the new-type reinforcing bars recently approved by the American Concrete Institute differ from other reinforcing bars? What are the advantages to be derived from using bars of the new type? Explain.

### New Corrects Weaknesses of Old

By Prof. H. J. Gilkey*
Head of Department of Theoretical and Applied Mechanics, Iowa State College, Ames, Iowa

The new-type reinforcing bars recently approved by the American Concrete Institute have deeper-cut, more closely spaced deformations or lugs than did any of the old-type deformed bars. Table I, excerpted from ASTM Designation A 305-50T, supplies the data on nominal diameters, areas, weights, and minimum lug requirements for the nine different sizes of 305 bars, which, for design purposes, are the only bars now recognized as deformed. Under Department of Commerce Simplified Practice Recommendation 26-50 this list of nine sizes of nominally round deformed bars supersedes former lists which included some squares.

The A 305 bars, as of now, include six different patterns all of which perform well, bond wise, each pattern having been shown by test to develop the full stress quota in about one-third the length of embedment formerly required. This short-length transfer of load from concrete to steel, besides stiffening the members, results in several other advantages:

(1) It virtually eliminates the need for hooks. This, in itself, not only saves steel, but substantially reduces detailing, fabrication and placing difficulties, uncertainties and costs.

(2) It controls tensile cracking by replacing wider-spaced, wider cracks with a far greater number of minute, closely spaced cracks which can constitute neither a corrosion hazard nor be a source of unsightliness.

(3) It paves the way for possible increases in working stresses for steel, especially the harder grades which have long been used with an expensively high margin of safety between current permissible working stresses and the yield point or ultimate strength of the steel. Prior to the advent of these better bars, bond (and the closely related diagonal tension) was the bottle-neck to increased stress in the steel—to resist more pull the bar needed to be better anchored.

Besides these obvious gains there have been the following by-products or incidental advantages:

(1) Passing mention has been made of the reduction to but nine standard sizes of deformed bars. As is apparent in Table I each size of bar is now designated by a number representing its nominal diam-

(*Continued on page 76*)

* Chairman of Committee on Bond Stress American Concrete Institute, past president, A.C.I., and chairman of A.S.T.M. Subcommittee on Methods of Testing Concrete for Bond.

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**TABLE I. DIMENSIONAL REQUIREMENTS FOR DEFORMED STEEL BARS FOR CONCRETE REINFORCEMENT**

**From 1950 ASTM Tentative Standard Specifications A305**

| | | Nominal Dimensions, Round Sections | | | Requirements of Deformations | | |
|---|---|---|---|---|---|---|---|
| Bar No.* | Unit Wt., Lb per Ft | Diameter, In. | Cross Sectional Area, Sq In. | Perimeter, In. | Max. Avg. Spacing, In. | Min. Height, In. | Max. Gap. In.‡ |
| 3 | 0.376 | 0.375 | 0.11 | 1.178 | 0.262 | 0.015 | 0.143 |
| 4 | 0.668 | 0.500 | 0.20 | 1.571 | 0.350 | 0.020 | 0.191 |
| 5 | 1.043 | 0.625 | 0.31 | 1.963 | 0.437 | 0.028 | 0.239 |
| 6 | 1.502 | 0.750 | 0.44 | 2.356 | 0.525 | 0.038 | 0.286 |
| 7 | 2.044 | 0.875 | 0.60 | 2.749 | 0.612 | 0.044 | 0.334 |
| 8 | 2.670 | 1.000 | 0.79 | 3.142 | 0.700 | 0.050 | 0.383 |
| 9† | 3.400 | 1.128 | 1.00 | 3.544 | 0.790 | 0.056 | 0.431 |
| 10† | 4.303 | 1.270 | 1.27 | 3.990 | 0.889 | 0.064 | 0.487 |
| 11† | 5.313 | 1.410 | 1.56 | 4.430 | 0.987 | 0.071 | 0.540 |

* Bar numbers are based on the number of ⅛ inches in the nominal diameter of the section.

† Bars numbered 9, 10, and 11 correspond to former 1-in. sq., 1⅛-in. sq., and 1¼-in. sq. sizes, and are equivalent to those former standard bar sizes in weights and nominal cross-sectional areas.

‡ Chord of 12½ percent of nominal perimeter.

**TABLE II. AMERICAN CONCRETE INSTITUTE ALLOWABLE UNIT BOND STRESSES IN CONCRETE**

| Old (1947) | | New (February 1951) | |
|---|---|---|---|
| *Deformed bars:* | | *Deformed bars* (without hooks):* | |
| In beams and slabs (without hooks) | $0.05f'_c$ | Top bars† | $0.07f'_c$ |
| In two-way footings (hooked) | $0.056f'_c$ | In two-way footings (except top bars) | $0.08f'_c$ |
| In beams, slabs, and one-way footings (hooked) | $0.075f'_c$ | All others | $0.10f'_c$ |
| *Plain bars:* | | *Plain bars (must be hooked):* | |
| In beams and slabs (without hooks) | $0.04f'_c$ | Top bars | $0.03f'_c$ |
| In two-way footings (hooked) | $0.045f'_c$ | In two-way footings (except top bars) | $0.036f'_c$ |
| In beams, slabs, and one-way footings (hooked) | $0.06f'_c$ | All others | $0.045f'_c$ |

* The revised unit stresses shown for deformed bars shall be used only for bars conforming to the ASTM Tentative Specifications for Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement, A305-50T. Deformed bars not meeting these requirements shall be classified as plain bars.

† Top bars are horizontal bars so placed that more than 12 in. of concrete is cast in the member below the bars.

eter in eighths of an inch. Drawings no longer need be cluttered by listing diameters. Manufacturers can easily roll the size designation directly into the bar thereby further simplifying and mistake-proofing job operations.

(2) The nominal areas and weights are the ones to be used for purchase and for acceptance testing as well as for designing—no longer is there any point in trying to arrive at actual average areas, or the net, or minimum area of an individual bar, or to complicate the purchasing operation by an allowance for tonnage overrun due to the weight added by the lugs. (For a discussion of these aspects see proceedings ASTM, Vol., 34 (1934), Part I, p. 84.)

(3) For the first time, the ACI code, in its 1951 version, distinguishes between "top bars" and others. Even where there is careful placement to avoid honeycombing, the lower side of any bar has poor bond. This is a result of the settlement of the plastic concrete, resulting in separation, water gain and the gathering of air bubbles on the lower surface of the bar. Although this condition had long been known, Menzel's tests pointed out its seriousness and focused attention on a critical need for taking code cognizance of the situation. For appreciable depths of concrete even the A 305 bars with their deep corrugations are not immune (though much more nearly so than are other bars). The weakening of the bond is progressive with the depth of concrete beneath the bar and the arbitrary figure of 12 in. is simply an effort to make a reasonable allowance without the considerable design complication inherent in attempting to correct on the basis of a sliding scale.

The development of the A 305 specification for bar patterns not only constitutes one of the great advances in concrete practice but it represents a clean sweep correction of weaknesses known, but passively tolerated, for nearly 40 years.

## Allow Greater Bond Stresses

By Assistant Engineer

New-type reinforcing bars recently approved by the American Concrete Institute differ from other reinforcing bars, as simply stated in ASTM A 305-49, in the surface deformations of the bars. No change was made in the Standard Specifications for Steel Bars for Concrete Reinforcement. The requirements for the deformation are that they shall be spaced along the bar at substantially uniform distances, that, where the line of deformations forms an included angle with the axis of the bars of certain limits, the pattern of the deformations should be reversed or positioned as defined.

The distance between the deformations, as well as their height is established in the specification. These vary as the nominal diameter of the bar. The adapted style was the result of a long-time development including a five-year test by the National Bureau of Standards.

The advantages of the new bars over the old style twisted or deformed bars, both of which are now classed by the A.C.I. as plain bars, are the more liberal bond stresses allowed. The permissible allowable bond stress for all except top bars and bars in two-way footings is 10 per cent of the design strength of concrete. This is double that previously permitted. For two-way footings, a design of 8 per cent is used although the exact definition of this style is pending in the A.C.I. Top bars are designed for a stress of 7 per cent and such a bar is defined as one in which more than 12 in. of concrete is cast below the bar.

A further advantage is the elimination of hooks for anchorage. Instead, bond stress is depended upon entirely. Allowable bond stress for plain bars is 4 per cent of the design strength of concrete except for top bars in two-way footings.

With the development of this bar, there arose a number system for specifying bar sizes. Sizes are now numbered from 3 to 11. Number 3 indicates a ⅜ in. diameter bar and No. 11 a 1⅜ in. bar, the steps representing the diameter of the bar in eighths of an inch.

# WHERE'D ALL THAT OIL GO?

This storekeeper is honest as the day is long . . . careful as the best accountant . . . ***but the cards are stacked against him.*** Why? Because he depends on "guessing" sticks or tank gauges for his inventory records! Tank gauges show only what's on hand . . . approximately. They don't tell what you received (to the gallon) and they can't accurately show how much goes into each diesel.

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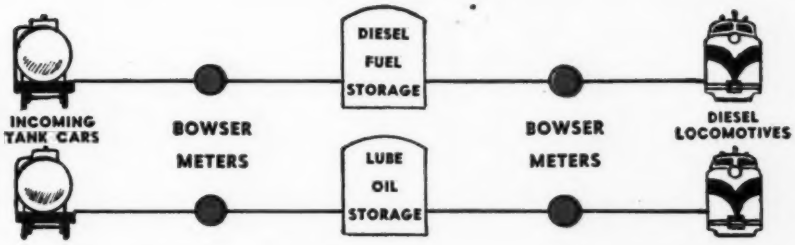


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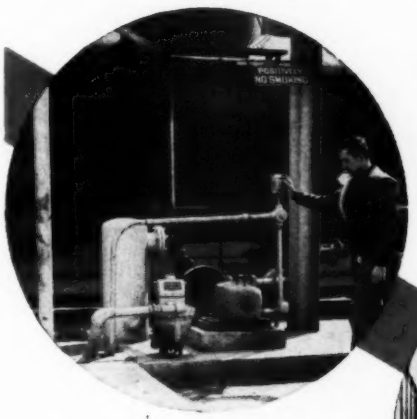
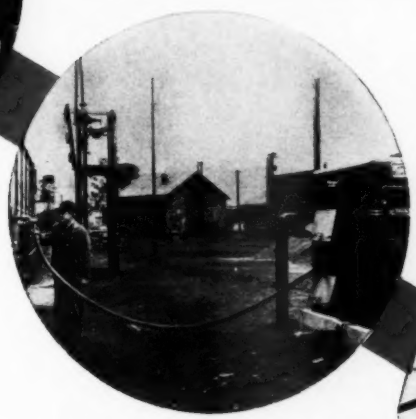


Bowser meters accurately check incoming liquids.

● Fuel and lube oil consumption records for diesel locomotives are made automatically with Bowser ticket printer meters.



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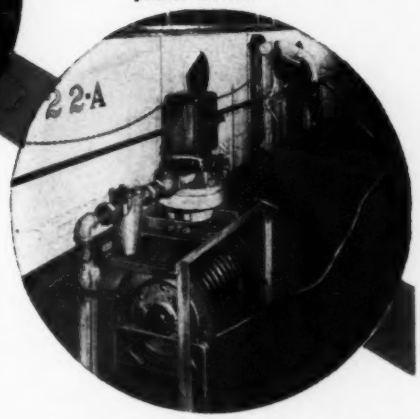


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# THE MONTH'S NEWS

## Happenings among the railways — the associations — the suppliers

## Changes in Railway Personnel

### Engineering

**J. H. Hunter,** division engineer on the Atlantic Coast Line, with headquarters at Savannah, Ga., has been appointed special assistant engineer at Wilmington, N.C.

**R. F. Beck** has been appointed assistant engineer on the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., succeeding **A. G. Dorland,** who has retired after 44 years of service.

**W. G. Dyer,** district engineer on the Canadian Pacific, at Vancouver, B.C., has been appointed engineer maintenance of way, Prairie and Pacific regions, with headquarters at Winnipeg, Man. He succeeds **T. E. Price,** who has retired.

**L. M. Swoap,** supervisor of construction on the Erie at Youngstown, Ohio, has been appointed assistant division engineer at Jersey City, N.J., succeeding **F. J. Haagen,** who has retired after 33 years of service.

**T. P. Polson,** engineer maintenance of way of the New York, New Haven & Hartford, has been promoted to chief engineer, with headquarters as before at New Haven, Conn. Mr. Polson succeeds **E. E. Oviatt** who has been appointed consulting engineer.

**E. C. B. Macnabb,** assistant district engineer, British Columbia district of the Canadian Pacific, has been appointed district engineer, Saskatchewan district, with headquarters at Moose Jaw, Sask. **K. A. Truman,** special engineer, Alberta district, with headquarters at Calgary, Alta, has been appointed district engineer there, succeeding **H. R. Younger,** who has retired.

**J. M. Kirchner,** supervisor of track on the New York division of the Pennsylvania has been promoted to assistant division engineer on the Maryland division, succeeding **H. W. Manning,** whose appointment as supervisor of personnel is reported elsewhere in these columns. **P. J. Harnish,** supervisor of track on the Chicago division, has been promoted to assistant division engineer on the Panhandle division, succeeding **J. H. Kerchner,** whose appointment as supervisor of personnel is also announced elsewhere in these columns.

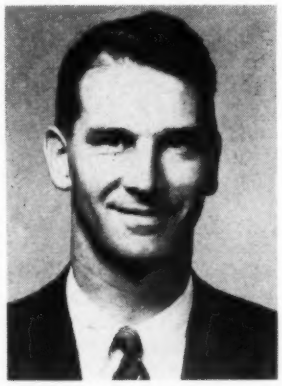
**Dan B. Packard,** who has been appointed engineer of buildings on the Atlantic Coast Line, with headquarters at Wilmington, N.C., as announced in the December issue, was employed on the A.C.L. during the summers of 1926-1928, returning to school each fall. After graduation he was assigned to the Charleston & Western Carolina as an inspector. In December 1931 he became draftsman in the chief engineer's office at Wilmington and in February 1937 was appointed assistant supervisor of building repairs. Mr. Packard became assistant engineer in the office of engineer maintenance of way at Savannah, Ga., in February 1939 and in March 1941 he was appointed senior assistant engineer in the office of the engineer of design. He was promoted to division engineer in February 1945, and was named special assistant engineer at Wilmington on March 16, 1947, which position he held until his recent appointment.

Dan B. Packard

**G. M. Strawhun,** whose promotion to division engineer of the Omaha-Northern Kansas division of the Missouri Pacific was reported in the November issue, was born at Falls City, Neb., on June 4, 1908. He entered railroad service with the M.P. on June 15, 1928, as a stenographer at Falls City, subsequently serving in clerical capacities in various other locations until June 14, 1936, when he became section foreman and extra gang foreman. He was promoted to track supervisor at Eads, Colo., on April 15, 1944, to roadmaster at Kansas City, Mo., on October 10, 1947, and to assistant trainmaster at Hoisington, Kan., on April 16, 1949. Mr. Strawhun then became assistant division engineer of the Omaha-Northern Kansas division on June 25, 1951, in which capacity he served until his promotion to division engineer.

G. M. Strawhun

**H. F. Dully,** whose promotion to division engineer of the Shasta division of the Southern Pacific was reported in the November issue, was born at Portland, Ore., on January 10, 1915, and obtained his higher education at Oregon State College, from which he was graduated in 1936 with a degree of Bachelor of Science in Civil Engineering. He entered railroad service with the S. P. in June 1936 as a rodman on the Portland



H. F. Dully

division, subsequently serving successively as draftsman, junior engineer and assistant engineer until December 1941, when he entered military service with the 813th Engineer Aviation Battalion. With that unit he served in Alaska and Okinawa as platoon commander, company commander and operations officer in the construction of various military facilities. Upon his discharge in December 1945, Mr. Dully returned to the S. P. as assistant engineer on the Portland division. He became assistant division engineer of the Sacramento division in April 1948 and held that position until his promotion to division engineer.

**S. N. Richardson,** assistant to division engineer on the Seaboard Air Line, has been promoted to assistant division engineer, with headquarters as before at Jacksonville, Fla. **A. C. Jones, Jr.,** student engineer at Jacksonville, has been appointed assistant to division engineer, and **J. R. Fraser,** assistant to division engineer at Jacksonville, has been transferred to Raleigh, N.C. **J. E. Krome,** assistant division engineer at Raleigh, has been promoted to bridge designer in the engineering department, with headquarters at Norfolk, Va. **W. G. Merritt,** assistant to division engineer at Atlanta, Ga., has been appointed assistant division engineer at Savannah, and **C. Y. Jordan,** student engineer at Raleigh, has been named assistant to division engineer at Howells, Ga.

## Track

**F. W. Fielder,** assistant roadmaster on the Chicago & North Western at Chicago, has been promoted to roadmaster at Casper, Wyo., succeeding **M. L. Bradbury,** whose death is announced elsewhere in these columns.

**I. J. Echelberger,** track supervisor on the Omaha division of the Chicago, Burlington & Quincy, has been promoted to roadmaster on the Lincoln division, with headquarters at Central City, Neb., succeeding **R. C. Hackney,** who has been transferred to Ferry, Neb. Mr. Hackney succeeds **W. V. Parker,** who has been assigned to other duties.

**D. E. Dresselhouse,** instrumentman on the New York Central, has been promoted to assistant supervisor of track, with headquarters as before at Chicago. He succeeds **D. Pinkerton,** who has been promoted to supervisor of track at Elyria, Ohio, succeeding **P. S. Margraf,** who has been transferred to Corning, Ohio. Mr. Margraf succeeds **R. J. McEwen,** who has been transferred to Kenton, Ohio. **Frank Diego,** assistant supervisor of track, has been promoted to supervisor of track with headquarters as before at Toledo, Ohio, succeeding **J. J. O'Connell,** who has retired.

### Changes on the Pennsylvania

**R. M. Williamson, Jr.,** junior engineer on the Panhandle division, has been promoted to assistant supervisor of track on the Lake division, succeeding **L. B.**

*(Continued on page 80)*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**For Removing Ties From Track**

**The Northwestern Type 49 Tie Pusher slides ties out smoothly with least disturbance to any type of ballast. Neither gauge nor line of tracks is disturbed, new ties are easily inserted. This simple, efficient tool is constructed of durable welded steel, weighs only 47 lbs., is easily carried in any motor car tool tray.**

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**Result:**

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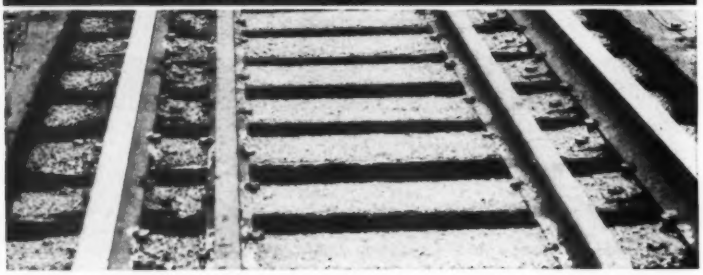

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## Railway Personnel (Cont'd)

**Ruch,** who has been transferred to the Philadelphia division. Mr. Ruch succeeds **J. T. Radcliffe,** who has been promoted to supervisor of track on the Philadelphia division, succeeding **R. R. McClain,** who has been transferred to the Southwestern division. Mr. McClain succeeds **L. A. Pelton,** who has been transferred to the New York division, replacing **J. M. Kirchner,** whose promotion to assistant division engineer is reported elsewhere in these columns.

**F. N. White,** junior engineer on the Columbus division, has been promoted to assistant supervisor of track on the same division, succeeding **D. W. Gangluff,** who has been advanced to supervisor of track on the Fort Wayne division. Mr. Gangluff succeeds **A. J. Heacox,** who has been transferred to the Philadelphia division, where he replaces **L. P. J. Bonfardin,** who has been transferred to the Fort Wayne division. Mr. Bonfardin succeeds **W. E. McColgin,** who has been promoted to main-line supervisor of track on the Middle division to replace **N. P. Patterson,** whose appointment as supervisor of personnel is reported elsewhere in these columns.

**A. W. Livergood,** junior engineer on the Pittsburgh division, has been promoted to assistant supervisor of track on the Susquehanna division, succeeding **J. W. Fuller,** who has been transferred to the New York division. Mr. Fuller succeeds **D. H. Kushwa,** who has been promoted to supervisor of track on the Panhandle division, succeeding **P. N. Kulick,** who has been transferred to the Conemaugh division. Mr. Kulick succeeds **R. D. Baldwin,** who has been transferred to the Fort Wayne division to replace **D. A. Sutherland,** who has been transferred to the Pittsburgh division.

**R. A. Shaw,** junior engineer on the Susquehanna division, has been promoted to assistant supervisor of track on the New York division, succeeding **R. P. Howell,** who has been transferred to the Maryland division. Mr. Howell succeeds **H. O. Stratton,** who has been promoted to supervisor of track on the Susquehanna division, succeeding **E. J. Sierleja,** who has been transferred to the Southwestern division. Mr. Sierleja replaces **J. J. Baffa,** who has been transferred to the Chicago division, where he replaces **P. J. Harnish,** whose promotion to assistant division engineer is reported elsewhere in these columns.

**T. T. Connely,** junior engineer at Dennison, Ohio, has been promoted to assistant supervisor of track at York, Pa., succeeding **F. R. Matthews,** who has been transferred to Baltimore. Mr. Matthews replaces **R. A. Jones,** who has been promoted to supervisor of track at Akron, Ohio, succeeding **H. M. Shoaf,** who has been transferred to Morrow, Ohio. Mr. Shoaf succeeds **A. F. Roper,** who has retired.

**R. H. Neeley** junior engineer on the Eastern division, has been promoted to assistant supervisor of track at Williamsport, Pa., succeeding **A. Tiedjen,** who has been transferred to Newport, Pa. Mr.

Tiedjen replaces **L. E. Ward,** who has been promoted to supervisor of track at Ashtabula, Ohio, succeeding **D. R. Wolfe,** who has been transferred to the Susquehanna division. Mr. Wolfe replaces **W. H. Lindsey,** who has been transferred to the Columbus division to succeed **R. M. Buchanan,** who has resigned.

**W. C. Wieters,** junior engineer on the Southwestern division, has been promoted to assistant supervisor of track on the Philadelphia division, succeeding **H. N. Lucas, Jr.,** who has been transferred to the New York division. Mr. Lucas replaces **D. J. Avoletta,** who has been transferred to the office of chief engineer, Eastern region.

## Special

**R. J. Dettling** has been appointed assistant general fire inspector on the Southern Pacific, with headquarters at San Francisco, Cal., succeeding **G. W. Rear, Jr.,** who has been promoted to general fire inspector at San Francisco. Mr. Rear succeeds the late **U. S. Attix.**

**Norris V. Engman,** associate editor of *Railway Engineering and Maintenance* and *Railway Age,* has been appointed assistant to the secretary of the American Railway Engineering Association. He succeeds **Edward G. Gehrke,** who has been promoted to assistant secretary of the A.R.E.A. to replace **Frank McNellis,** who has resigned.

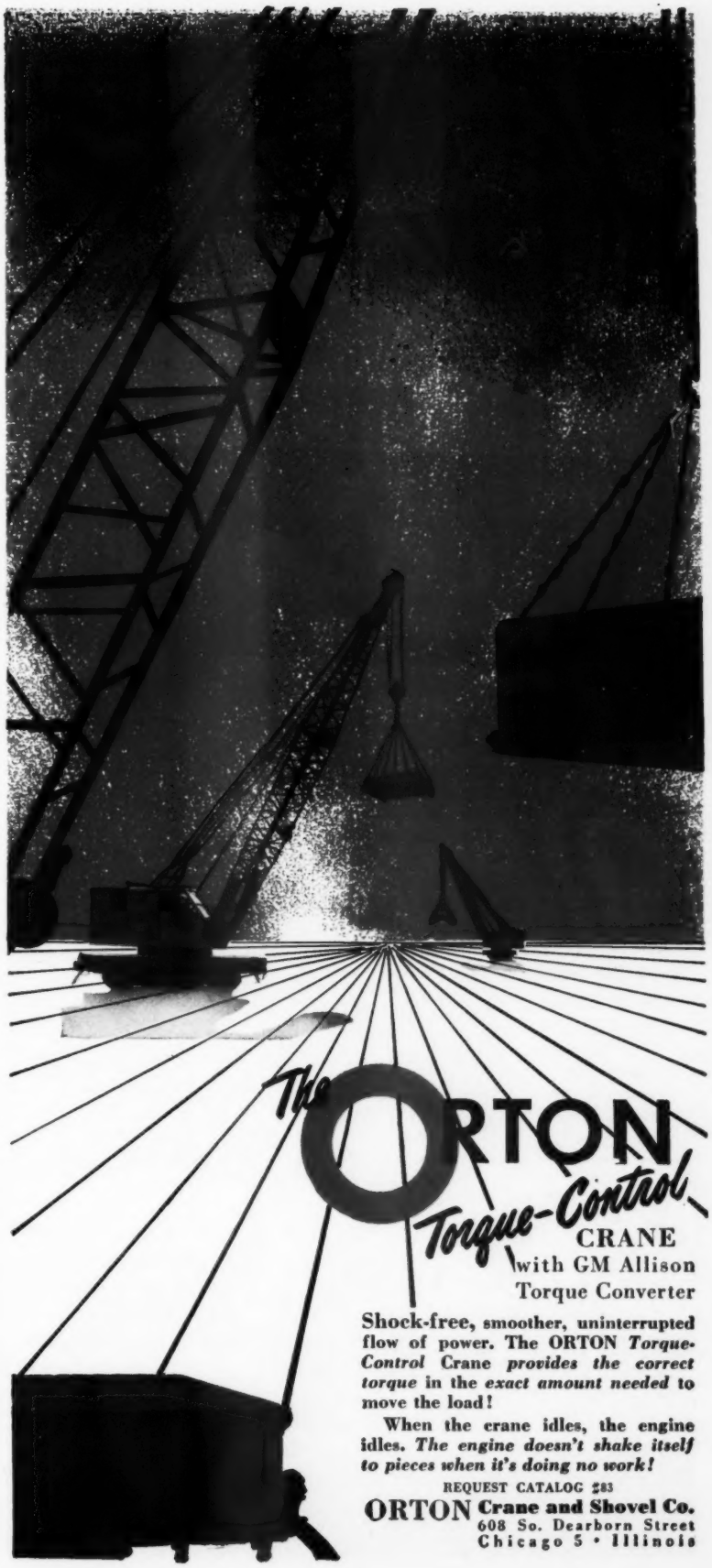
**H. W. Manning,** assistant division engineer on the Pennsylvania at Baltimore, Md., has been appointed supervisor of personnel on the Susquehanna division; **J. H. Kerchner,** assistant division engineer on the Panhandle division, has been appointed supervisor of personnel on the Conemaugh division; and **N. P. Patterson,** supervisor of track on the Middle division, has been appointed supervisor of personnel on that division.

## Obituary

**M. L. Bradbury,** roadmaster on the Chicago & North Western, with headquarters at Casper, Wyo., died recently.

**F. S. Sosnowski,** retired roadmaster on the Canadian National, died recently at Toronto, Ont., at the age of 73.

**Gustav Van Hemert Schneider,** retired civil engineer on the Southern Pacific, died recently at San Francisco, Cal.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# Association News

## Maintenance of Way Club of Chicago

John R. Rushmer, roadway engineer, Atchison, Topeka & Santa Fe System, was the principal speaker at the December meeting of the club, which was held on the 17th at Eitel's restaurant, Chicago. The subject of his talk was "Recent Developments in M/W Machines." Among other things he mentioned a number of entirely new machines for doing maintenance of way work that are now under development or are being tested on the Santa Fe.

## Metropolitan Maintenance of Way Club

The annual luncheon meeting was held at the Hotel Shelburne, New York, on December 6, with 185 members, and a number of guests, in attendance. The main feature of the meeting was a talk, entitled "Materials and Methods in Maintenance of Way," by J. B. Akers, former president of the American Railway Engineering Association and chief engineer of the Southern, in which he dealt primarily with recent developments and trends affecting maintenance of way work.

The next meeting of the club has been scheduled for the evening of February 28, 1952, the program to be announced later.

## Bridge and Building Association

The personnel of all eight committees that are to present reports on technical subjects at the 1952 convention has now been selected. This work was done by the Executive committee at a meeting held at the St. Charles hotel, New Orleans, La., on December 4 and 5, under the direction of Guy E. Martin, president. All members of the Executive committee except two were in attendance. The next meeting of the committee will be held March 10, 1952, at the Engineers' Club, Chicago. This is one day in advance of the opening of the annual convention of the American Railway Engineering Association.

## American Railway Engineering Association

At the time of going to press the following committees had scheduled meetings to be held this month: Buildings,


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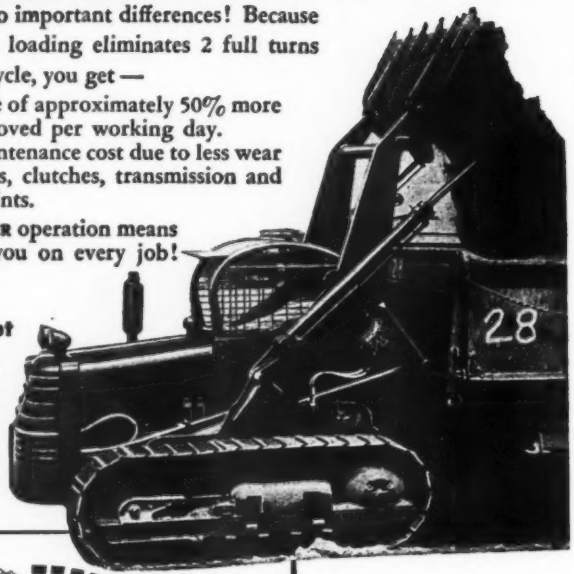


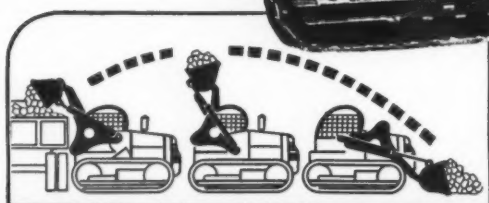

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## Meetings and Conventions

**American Railway Bridge and Building Association**—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

**American Railway Engineering Association**—Annual Meeting, March 11-13, 1952, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

**American Wood-Preservers' Association**—Annual meeting, April 22-24, 1952, Hotel New Yorker, New York. W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

**Bridge and Building Supply Association**—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

**Maintenance of Way Club of Chicago**—Next meeting January 28. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

**Metropolitan Maintenance of Way Club**—Secretary, 30 Church street, New York.

**National Railway Appliances Association**—Robert A. Carr, Secretary, 310 South Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

**Railway Tie Association**—Roy M. Edmonds, Secretary-treasurer, 912 Shell Building, St. Louis 3, Mo.

**Roadmasters' and Maintenance of Way Association of America**—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

**Track Supply Association**—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

January 24-25, Cleveland hotel, Cleveland, Ohio; Masonry, January 10-11, Roosevelt hotel, New Orleans, La.; Records and Accounts, January 16-17, Statler hotel, New York; Economics of Railway Location and Operation, January 14, Cleveland hotel, Cleveland; and Yards and Terminals, January 18, Hotel Lennox, St. Louis, Mo. On January 19 the latter committee will inspect the new Missouri Pacific consolidated freight terminal at St. Louis.

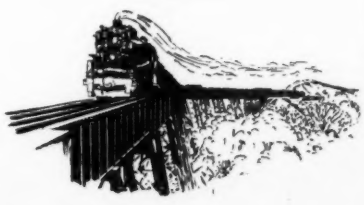
### National Railway Appliances Association

Indications are that the exhibit of manufacturers' products, to be held at the Coliseum Chicago March 10-13, in connection with the annual convention of the American Railway Engineering Association, will be one of the largest on record. As of the time of going to press applications received for space were sufficient to absorb practically all of the 265 booths available, with a number of additional applications pending. However, by some reassignment of space, it was expected that it would be possible to accommodate all manufacturers who wish to participate in the exhibit. At the time of going to press a total of 112 companies had definitely signed for space. Inquiries for information regarding the exhibit and the space available should be addressed to Lewis Thomas, director of exhibits, National Railway Appliances Association, 59 E. Van Buren Street, Chicago.

### Roadmasters' Association

Under the direction of A. H. Whisler, president, the Executive committee met at Chicago on December 10, primarily for the purpose of selecting the personnel of the six committees that are to present technical reports at the 1952 convention. Since about 250 members sent in return postcards indicating their preferences for service on these committees, no difficulty was experienced in organizing a well rounded committee to investigate each of the subjects.

It was decided to hold the next meeting of the Executive committee on Monday, March 10, which will be the day preceding the opening of the annual convention of the American Railway Engineering Association. The March 10 meeting of the Executive committee will be held at the Palmer House, Chicago. It is planned to adjourn the meeting about noon to give the members an opportunity to inspect the manufacturers' exhibit that is to be held at the Coliseum in connection with the A.R.E.A. convention.



# Supply Trade News

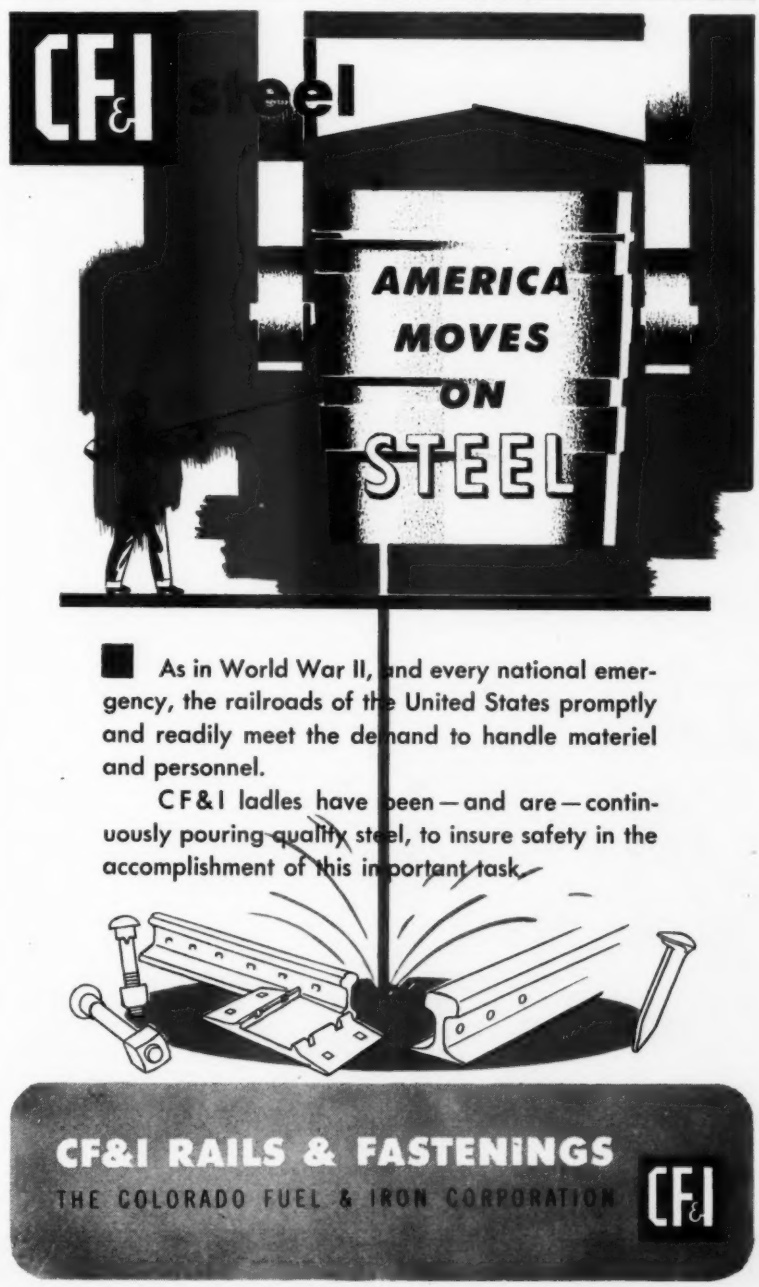
## General

**The Stonhard Company**, with present headquarters at 1306 Spring Garden, Philadelphia, will erect a new one-story building at Broad and Huntington streets, to house the company's offices, warehousing and manufacturing facilities. The building, which will contain 42,000 sq. ft., will cost $600,000.

The Philadelphia division of **Yale & Towne Manufacturing Company** has appointed the **Baker Equipment Engineering Company** as representatives for the Yale line of materials-handling machinery in the Charleston, W. Va., marketing area. Sales engineers of Baker will operate from offices in Charleston, Huntington, Bluefield and Clarksburg.

**The Pittsburgh Plate Glass Company** will enter the fiber glass production field in the near future and formation of a separate development and production unit—the Fiber Glass Division—is now in process, Richard B. Tucker, executive vice-president, has announced. **J. Hervey Sherts** will head the new division as general manager.

(*Turn to page 84*)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## Supply Trade News (Cont'd)

### Personal

**William E. Russell, Jr.**, of the New York law firm of Russell & Russell, has been elected a member of the board of directors of the **Simmons-Boardman Publishing Corporation**, publishers of **Railway Engineering and Maintenance** and other publications in the transportation and building industries. Mr. Russell takes the place on the directorate formerly occupied by the late Mrs. Ida R. Simmons, who was principal stockholder in the publishing company. His father, senior member of the Russell & Russell firm, has been on the directorate of the publishing company for many years and is trustee under the will of the late Mrs. Simmons of the controlling stock interest in the publishing company. The Russell firm has for many years handled the legal affairs of the publishing company.

William E. Russell, Jr.

Mr. Russell, Jr., is a graduate of Trinity School (N.Y.), Phillips Exeter Academy, Yale University and the Yale Law School, at all of which he achieved high scholastic honors, among them election to the Phi Beta Kappa society. He became associated with the law firm of Cravath, deGersdorff, Swaine & Wood in 1934 and participated in much important corporate litigation, including the so-called Schechter "sick-chicken" case, in which the National Recovery Act was declared unconstitutional; and in the Milwaukee Railroad reorganization. He was assistant counsel for the Truman Committee investigating defense expenditures in 1943-43 and has been a member of the Russell & Russell firm since 1942. He is a director of Dumari Textile Company and is trustee for a large mortgage company.

**John S. Vreeland,** sales representative for the railway publications of the **Simmons-Boardman Publishing Corporation,** has been elected a vice-president of the corporation.

Mr. Vreeland was born at Cincinnati, Iowa, on November 16, 1907, and was graduated in engineering from Iowa State College, Ames, Iowa, in 1928. He


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worked two summers before graduation in the engineering department of the Chicago, Rock Island & Pacific and after graduation joined that road as a rodman. He later was promoted to instrumentman and served in the engineering department at various points in Iowa, Minnesota and Missouri. He also worked on new line location and construction in Missouri and as an inspector, checking joint facility accounts. In June, 1931, he

John S. Vreeland

was appointed supervisor of track and worked in that capacity at various points in Arkansas, Oklahoma, Iowa and Missouri. Mr. Vreeland joined the Simmons-Boardman Publishing Corporation as associate editor of **Railway Age** and of **Railway Engineering and Maintenance** at Chicago, in April, 1938, and was advanced to eastern engineering editor of **Railway Age** and eastern editor of **Railway Engineering and Maintenance** in September, 1944. He was appointed sales representative for the company's railway publications in June, 1946.

**L. D. Reed,** executive engineer of the **Whiting Corporation,** Chicago, retired from active duty on November 30.

**H. A. Glatte** has been appointed general sales manager of the Tile-Tex division of the **Flintkote Company,** Chicago Heights, Ill., succeeding **J. O. Heppes,** who has resigned.

**Charles F. Palmer** has been elected president of the **Peerless Equipment Company,** a subsidiary of **Poor & Co.,** succeeding **William E. Gray,** who has resigned. Mr. Palmer will have headquarters at Chicago.

**C. Paul Corrigan** has been appointed eastern sales manager and **Westley C. Muller,** western sales manager, for the Ramapo-Ajax division of the **American Brake Shoe Company.** Mr. Corrigan and Mr. Muller formerly were district sales managers at Cleveland and Denver, respectively.

**Elmer M. Miller,** formerly service engineer for the **National Aluminate Corporation,** has been appointed assistant to vice-president, with headquarters as before at Chicago. Mr. Miller will continue to handle sales and service of Nalco products on a number of midwestern railroads.

**R. F. Davis,** formerly assistant regional manager, Central region, of the **Cummins Engine Company,** at Chicago, has been promoted to regional manager, Eastern region, with headquarters at New York. Mr. Davis succeeds **Walter N. Westland,** who has been appointed head of Cummins Diesel of New England, Inc., with headquarters at Allston, Mass.

**Frank E. Kyndberg** has been appointed district sales manager, Waukegan district, of the **American Steel & Wire Co.'s** Cyclone Fence division. **Arthur C. Correll** succeeds Mr. Kyndberg as district sales manager of the southeastern district, with headquarters at Savannah, Ga. **A. B. Wyllie,** formerly in charge of Cyclone Fence division at Milwaukee, succeeds Mr. Correll in the sales organization of the division in Pittsburgh.

## Obituary

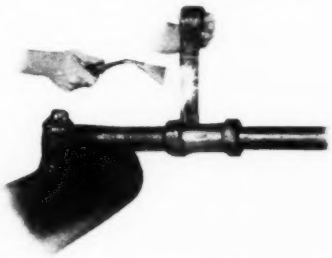
**Albert C. Senseney,** division manager, Railway Sales department, of The Lehon Company, since 1937, died at Chicago on November 21, 1951, at the age of 62.

**Joseph A. Brownell,** formerly assistant manager of railway sales for the Texas Company, in New York, died on November 24, 1951. He was 66 years old.

**Raymond C. Force,** first president of the Caterpillar Tractor Company, and a member of its board of directors and its executive committee, died on November 15, 1951 in Oakland, Cal.

More and more railroad maintenance men are depending on TAPECOAT to protect pipe joints and short pipe sections in underground service, at bridge crossings and wherever corrosion is a problem.

TAPECOAT is the coal tar protection in handy tape form. It comes in widths of 2, 3, 4, and 6 inches for spiral wrapping; and in widths of 18 and 24 inches for cigarette wrapping of large diameter pipe, tanks, etc.



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***Originators of the Coal Tar Tape for Pipe Joint Protection***

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One of the marvels of engineering skill is the track of American railroads. It takes a terrific beating under every extreme of weather.

It is subjected not only to constant expansion and contraction but to tremendous shocks and stresses, as heavily loaded freights and fast passenger trains roll over it.

Fine track must have what it takes, and that's why the roads spend so much to lay it well and maintain it carefully.

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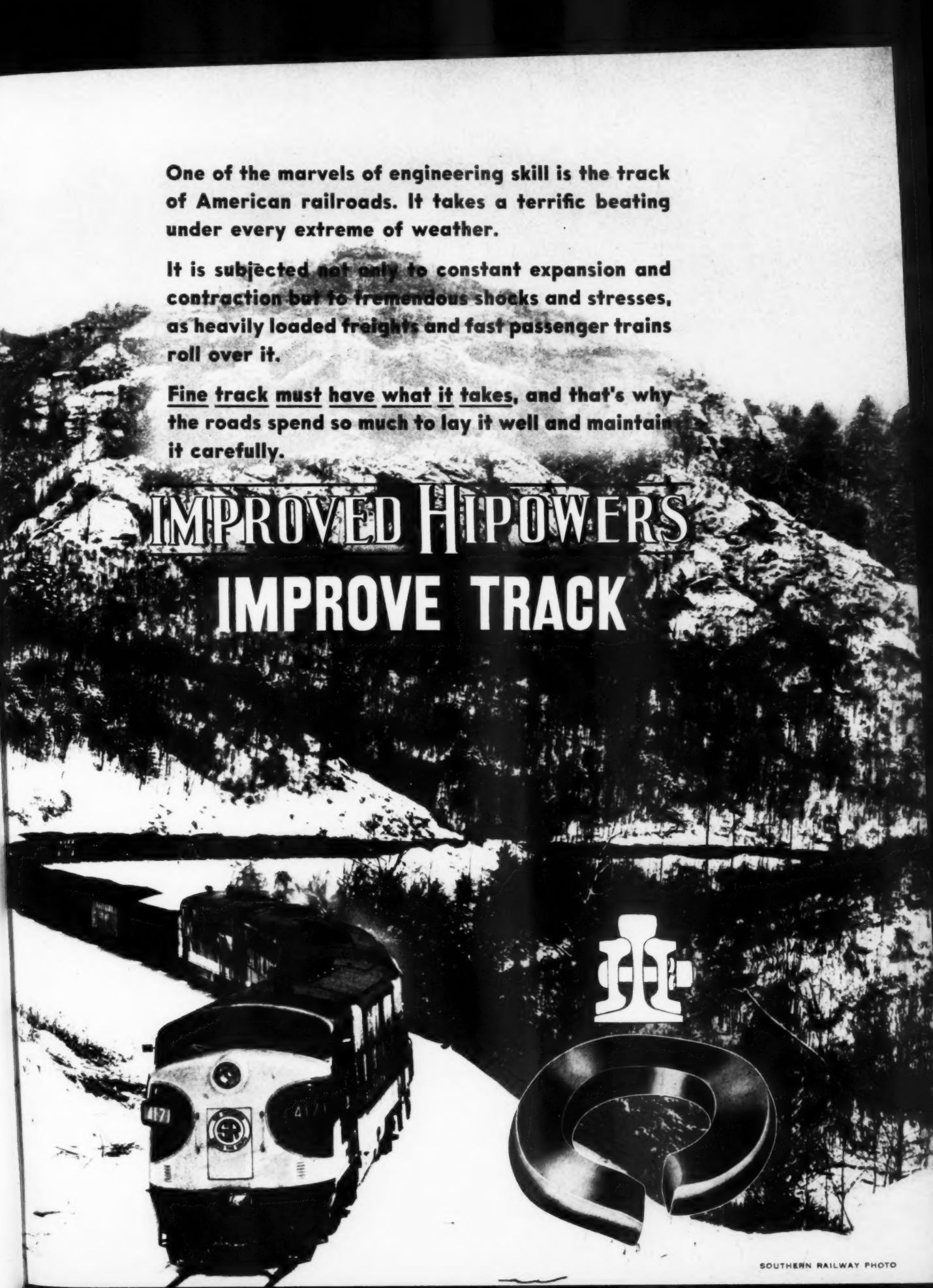

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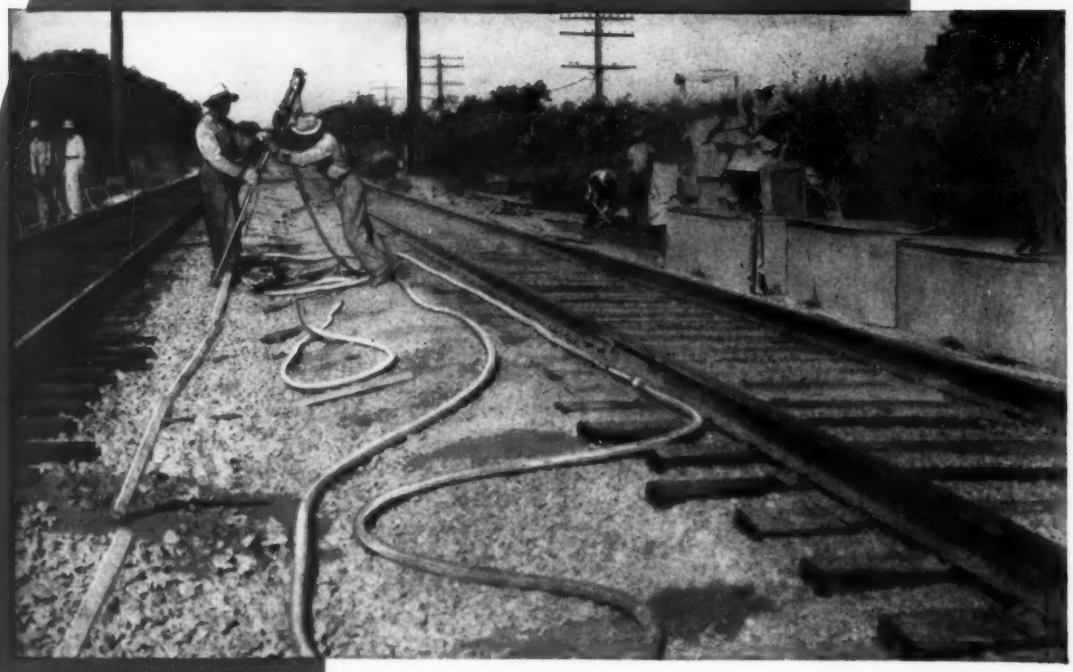

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